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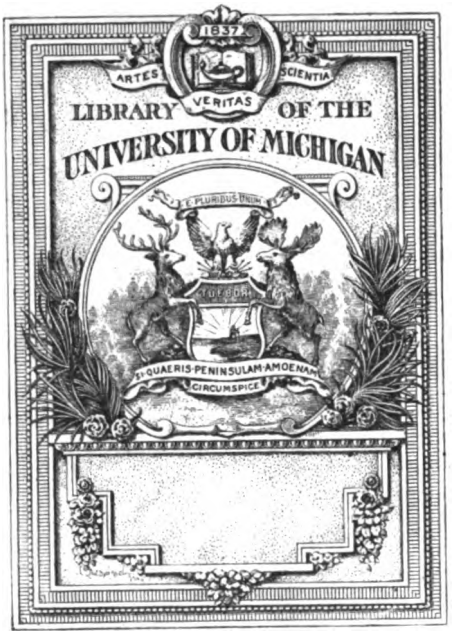

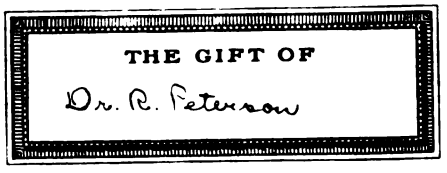

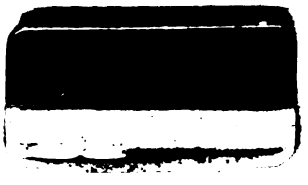

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OF THE

CLINICAL SOCIETY

OF THE

UNIVERSITY OF MICHIGAN

OCTOBER, 1911—OCTOBER, 1912

VOLUME III.

EDITED BY THE SECRETARY-TREASURER.

FOUNDED MDCCCCIII
UNIVERSITY HOSPITAL
ANN ARBOR, MICHIGAN
1912

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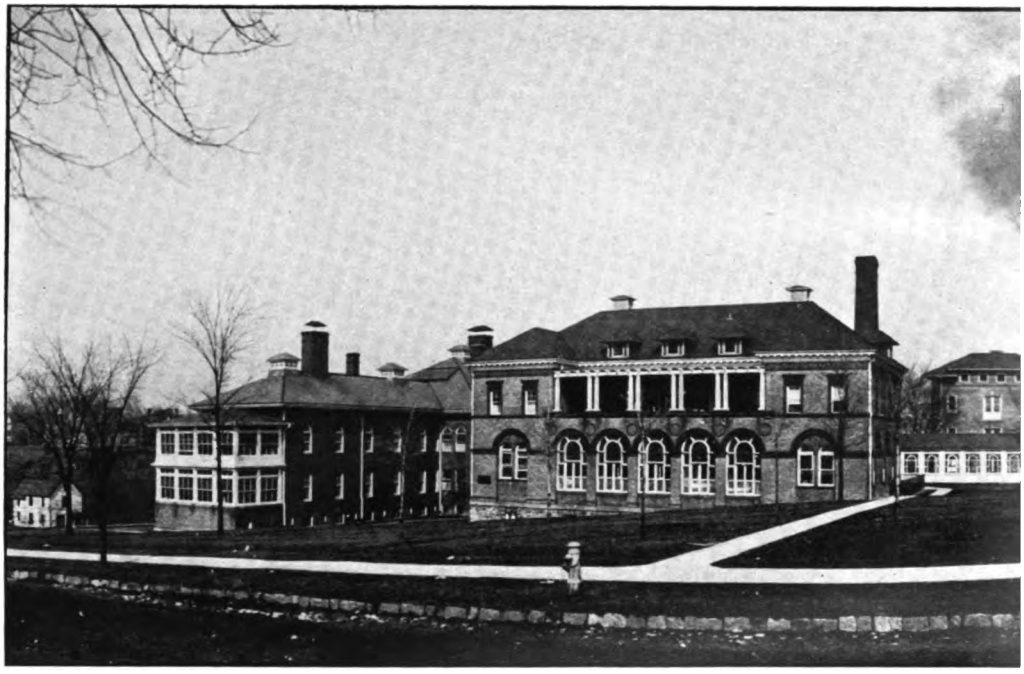

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STATED MEETING, OCTOBER 11, 1911.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.

REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS.

REPORT OF TWO CASES OF ACIDOSIS; ONE WITH AUTOPSY.

WARD F. SEELEY, M. D.

ANN ARBOR, MICHIGAN.

Case 1.—Mrs. M., aged forty-eight, entered the Gynecologic clinic July 28, 1911. Family and personal histories are in all respects negative. She entered the hospital complaining of severe headache, diagnosed by Doctor Klingmann as migraine. There was also a tender area in the left lower quadrant, which had been said by her physician to be due to an abscess. Her gynecologic examination showed an inflammatory mass in the left side of the pelvis, extending into the posterior culdesac. Her lungs were negative. There was a systolic murmur at the apex and in the pulmonary area. Her urine on entrance showed no albumin nor sugar but a few granular casts were seen. Her stomach on two occasions showed no free hydrochloric acid.

Patient was operated upon August 8, 1911, panhysterectomy being done. The operation was a difficult one, there being many adhesions and was accompanied by considerable hemorrhage and oozing. The pelvis was packed with gauze, drainage being left from below. The operation required two hours and forty-five minutes to complete. The pathologic report showed the uterus to be of the fibroid variety, appendages adherent and one ovary cystic.

On the third day after the operation the patient began having frequent stools, which rapidly developed into a very severe diarrhea, with twelve or fifteen movements daily. This condition persisted until the fifteenth day and was accompanied by nausea and vomiting, which gradually grew more severe, for the relief of which the stomach was repeatedly washed. On the afternoon of the fifteenth day after operation, the patient went into a state of collapse, with cold, moist extremeties, violent hiccough, temperature of 102.2°, pulse of 120, and respiration of 34. Hypodermoclysis was resorted to and the next day the patient was much improved. The nausea and vomiting, however, still persisted and gradually grew more and more severe. About the

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twentieth day the patient complained of difficulty in swallowing and upon examination of the throat a pseudodiphtheritic membrane was discovered. The patient at this time was unable to take nourishment by mouth on account of the excruciating pain accompanying the swallowing. Rectal feeding was then resorted to. At this time the abdominal wound having healed except for a small pocket at the lower extremity the patient was transferred to the Medical clinic. As the throat was practically clear the patient was tried on very small quantities of salt solution by mouth, but complained of intense pain in the lower thoracic region, and was consequently put again on rectal feeding. At this time the patient was nauseated and vomited at times, but the condition was apparently not so severe as previously. After four days of rectal feeding, nourishment by mouth was again tried and fairly well borne. The urine was very acid and showed both diacetic acid and acetone, which persisted in all subsequent examinations. Three or four days after this the vomitus began to show blood, the amount rapidly increasing. The stomach was washed with ice water and chloretone was given, with only temporary relief. There were suspicions of a pneumonic process but this could not be demonstrated clinically. The patient continued to grow weaker and the gastric hemorrhage more severe. Shortly before death the axillary temperature was 104°, pulse 160, respiration 72.

Autopsy findings:—Lungs; purulent metastatic pneumonia, congestion and edema, streptococcus infection. Heart; cloudy swelling, fatty degeneration and brown atrophy. Spleen; atrophy and chronic passive congestion. Kidneys; marked cloudy, swelling, numerous hyaline glomeruli, marked passive congestion and hyaline casts. Pancreas; slight atrophy. Stomach; chronic catarrhal gastritis with cystic glands, Liver; extremely fatty degeneration and infiltration with simple necrosis; findings evidently due to some intense intoxication, either an infectious process or a combination of the same with chloroform or some other poisoning. Bladder; slight chronic cystitis.

* * *

Case II.—Mrs. O., aged forty-eight, was admitted to the Gynecologic clinic August 8, 1911. She came to the hospital for excessive flowing during her menstrual periods and for an abdominal tumor. Her family and personal histories were practically negative except for occasional attacks of vomiting, without apparent cause, which began in December last. On entrance her blood was negative. The urine showed albumin and hyalin casts, but no sugar. Gynecologic examination showed a large fibroid uterus with adherent appendages. Examination of the heart showed the apex to be in the fifth intercostal space well beyond the middle clavicular line. There was a loud systolic murmur at the apex, transmitted to the axilla with accentuation of the pulmonic second. Examination of the lungs was negative. There was a slight Graeffe sign, a moderately enlarged thyroid, fine tremor of the fingers and heart rate of 114. A diagnosis of mitral insufficiency, chronic interstitial nephritis and hyperthyroidism was returned with advice that patient be transferred to the Medical clinic for treatment and further observation before operation. On entrance into the Medical clinic the patient was put on a course of digipuratum which was quite successful in reducing the heart rate. When sent back to the Gynecologic clinic for operation, the rate varied between 80 and 88. The urine

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was free from albumin but a few casts were found. No glucose was present at any examination.

The operation (panhysterectomy) was a severe one, the uterus being bound down by adhesions, so that it was impossible to elevate it and deliver it without the abdomen. After the operation, for a few days, the patient's condition was uneventful, when a paroxysmal irregularity of the heart, of the permanently irregular type, developed. This condition continued intermittently and is still noted at times. The pulse ran from 120 to 135, but the temperature was not elevated in proportion. On the eleventh day after the operation, the patient began to complain of nausea and vomited small amounts. The condition, however, did not become severe until the fifteenth day.

The patient at this time was having frequent stools, averaging seven daily and on the twentieth day nourishment by mouth was refused. Shortly after this patient was again transferred to the Medical clinic, the laparotomy wound having healed by first intention. On entrance into the medical service the patient was extremely nauseated, vomited frequently and was put on rectal feeding and given gastric lavage with ice water. There was a sweetish odor to the breath and acetone was demonstrated in the urine, which was very highly acid. The pulse varied from 128 to 144, temperature about 99°, blood pressure 138. Vomitus showed no free hydrochloric acid. Sodium bicarbonate in doses of two drachms, twice daily, was given by rectum; and as soon as the nausea somewhat subsided, liquids containing considerable sugar were taken by mouth. Hypodermoclysis of ten ounces of a two-per-cent solution of sodium bicarbonate was given under each breast. It was gratifying to note that on the third urinary examination, after entrance, tests for acetone were negative and the urine alkaline. The diarrhea, which had heretofore been rather severe, also diminished and at the present time the patient is having only one stool daily. Progress has been rapid since the acidosis has disappeared and unless there are further complications, recovery can be looked for.

In a discussion of acidosis, Edsall, in the *British Medical Journal*, states "that as a consequence of the use of ammonia to neutralize the acid, ammonia is excreted in abnormally large amounts in the urine, and the presence of ammonia in abnormal quantity, is therefore an index of the extent of acid intoxication." In the human body only one acid is known to occur in quantities large enough to be dangerous, the acid in question being beta-oxybutyric. Acetone and diacetic acid are oxidation products of the mother substance. Diabetes is of course the classic condition in which the acidosis is found; other conditions are starvation; various poisonings, especially by some of the narcotics; severe digestive disturbances; cyclic vomiting of children; acute yellow atrophy; phosphorous poisoning; eclampsia; after anesthesia and in certain neurologic conditions.

The occurrence of a large amount of acid in acidosis is dependent upon two main factors, the inability to use carbohydrates and the coincident excessive use of fats. The same conditions obtain in starvation, where no carbohydrate is taken and large amounts of body fat are burned. Cases are seen, however, in which acidosis is clearly marked at the very beginning of the symptoms, when there has been no change of diet. There are, therefore, two types of acid intoxication. In the

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diabetic type there are no tissue lesions sufficient to explain the amount of intoxication. In the other type there are serious lesions, which evidently may of themselves be enough to produce violent symptoms.

The work of Reichter on the influence of narcotics upon the fat content of the blood, shows that such substances as chloroform mobilize large amounts of body fat. The oxidation process being probably reduced by the chloroform, the fats are not properly oxidized and their by-products in the form of acids accumulate in large amounts. That the acids do harm in these conditions is shown by the fact that in a fair proportion of cases, as Wallace and others have shown, carbohydrate and alkali treatment will go far toward preventing postanesthetic intoxication.

The older literature on the subject of acidosis lays much stress on chloroform poisoning. More recent work, however, shows that this condition occurs frequently after ether, as well. The length of anesthesia, while to some extent an index to the amount of intoxication, is not always reliable for diagnostic purposes as both acetone and diacetic acid are found after anesthetics of not unusual length. French authors lay considerable emphasis upon the acetonemic vomiting.

In regard to the autopsy findings in acidosis, those of Mrs. M. are quite typical. Acute degeneration of the liver with fatty degeneration and infiltration is the common finding. Fatty degeneration in other organs, as the heart, is also frequently found. It must be understood, however, that these findings are only typical in cases of the second type above described, there being no lesions in the clinical form of which diabetes and starvation are types.

DISCUSSION.

DOCTOR LUTHER F. WARREN: To realize that such a condition is a definite entity all one needs to do is to read the literature of the past two years and see what Folin, Edsall, Joslin, Ewing, Hale and others have written on this subject. True it is that most cases of acidosis are typically found in diabetes, but there are a great many scattered cases of acidosis developing primarily and not associated with glycosuria. Gundrman, of the Johns Hopkins, last year compiled a series in which he found thirty per cent of the postoperative cases showing acetone in the urine. Thinking that such a condition might be due to ether, he noted the findings following chloroform, nitrous oxide, ethyl chloride, et cetera, and found that these bodies appear in about the same kind of cases as those following ether. In his cases of severe vomiting, after the third day, he invariably found diacetic acid and always found acetone in increased amounts. Wallace, of London, states that these cases have a definite symptom complex as follows:

When the patient continues to vomit after the third day and there is a rise in pulse rate, not due to a complication, he becomes anxious, nervous and restless. These bodies are usually found in conditions with symptoms from the acid intoxication. Why these bodies appear is not definitely settled. However, Joslin's work throws some light upon it. He starved some medical students at Harvard and found these acid bodies appearing in the urine. In all probability this is one of the reasons why they are present.

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DOCTOR ALBION W. HEWLETT: The picture in the first of these cases was a striking one. She vomited continually and without any apparent cause and in addition there was great pain on swallowing. The latter was attributed to an esophagitis but at autopsy no cause for it was found. Too much importance should not be placed upon the appearance of acetone in the urine after operation as it occurs not infrequently at such times and may occur in any person who is suddenly starved after being on a full diet. When diacetic acid also appears the condition is more serious. Such cases as these occur more frequently after chloroform and have been spoken of as late chloroform poisoning but they may also occur after ether. The character of the second case was more doubtful for the reason that less of the acetone bodies was found and also because she had hyperthyroidism which might account for many of her symptoms.

EXCISION OF THE LARYNX FOR MALIGNANT DISEASE.

REGINALD C. PLUMMER, M. D.
ANN ARBOR, MICHIGAN.

THE patient, a farmer, resident of Michigan, aged sixty-two, of American parentage, was referred to the Otolaryngologic clinic from the Medical clinic for examination of the nose and throat. The patient gave a history of having been hoarse for two years, gradually becoming worse so that at the time of the examination he was unable to speak above a whisper. He also complained of increasing difficulty in respiration, particularly at night or when he attempted to lie down. Patient stated that he had been compelled to rest in nearly an upright position most of the time. He had lost considerable weight, although he did not know how much. He had a dry cough and prespired freely at night.

Examination showed the patient very much emaciated and weakened, face somewhat cyanotic, with great difficulty in breathing which made it difficult for him to talk. Examination of the larynx showed marked infiltration of the left false cord and at the base of the left arytenoid, and considerable edema over the base of the epiglottis in the median line. Both ventricles were filled with a papillomatous mass covering the right cord entirely and the left partially and appearing below the cords in the subglottic space, leaving merely an irregular slit through which the patient was able to breathe. External examination showed a few glands in the submaxillary region, and the left side of the larynx slightly more prominent over the thyroid cartilage than the right. Physical examination revealed piping, squeaking râles over the chest with increased resonance over the back, but no dullness. Complete laryngectomy was advised. This, however, the patient refused at this time, but decided to submit to a tracheotomy for relief of his difficult respiration. Tracheotomy was performed and a large tracheotomy tube placed in position.

The patient made a good recovery and went home against advice promising to return in a week for further examination and for consideration of complete removal of the tumor.

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During the tracheotomy a specimen of the growth was removed which was sent to the Pathologic laboratory and a report returned by Doctor Warthin of squamous-celled carcinoma, a diagnosis corresponding with the clinical findings.

The patient returned about a week later having gained nine pounds and otherwise being improved. Examination of the larynx, however, showed some increase in the tumor mass. Complete excision was again advised and the patient in view of his improvement with the tracheotomy tube consented to the operation.

Operation.—Complete laryngectomy. The patient was placed upon the table, the head of which was tipped down very low to prevent the aspiration of blood during the operation. Incision was then made from somewhat above the cricoid cartilage to the notch of the sternum. The incision was carried down through the superficial and deep fascia to the larynx and trachea in median line. The larynx was dissected out on either side to the esophagus. After the tissues were retracted away the growth was seen to have forced its way through the thyroid cartilage in its lower portion on the left side. The tracheotomy tube was removed. The trachea was severed at this point because the growth had invaded and filled the subglottic space practically to that point. With great care the larynx was freed from the esophagus, the vessels being tied and cut as they were approached. The larynx was tipped up and out until the upper margin of the esophagus was reached, whereupon it was severed from the esophagus, the incision being carried around passing the base of the epiglottis. As there was no evidence of any growth in this region, the epiglottis was left in position. The larynx with tumor having been removed, the mucous membrane of the anterior esophageal wall was sutured with continuous sutures of twenty-day catgut to the mucous membrane of the epiglottis and the muscles of the tongue. The fascia over the esophagus was sutured to the deep fascia of the tongue, making a secondary line of retention sutures. The deep fascia and the muscles were brought together in the median line with catgut down to the point where the open end of the trachea was brought out and made fast to the skin by anchor sutures, the skin being sutured with silk down to the opening of the trachea.

The head of the table was kept low throughout the operation and the patient was carried in this position to his bed, the foot of which was raised about two feet. The patient was in good condition although the heart was slightly intermittent. He was given whisky and coffee by enemas, and salines were ordered for every four hours and later alternated with nutritive enemas. The patient reacted from the anesthetic and expressed his good feelings by attempting to whisper and by a strong grip of his hand.

The second day there seemed to be considerable infiltration along the sides of the neck and edema over the face. On the third day the bed was lowered about one third the way, the patient complaining of severe headache. On the fourth day the bed was lowered completely and the patient felt much relieved, the wound being in good condition. On this day the patient wrote that pain on swallowing had practically disappeared so liquids were started by mouth in increasing amounts

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until the sixth day when the nutritive enemas were discontinued. Thereafter the patient took all nourishment by mouth. From this time on he improved rapidly and on the ninth day was out of bed in a wheel chair for an hour, feeling only slightly fatigued when he was returned to bed. On the tenth day the anchor sutures were removed. The trachea was found firmly adherent to the soft parts and the mucous membrane firmly attached to the skin.

From this time on recovery was uneventful, the patient remaining at the hospital merely to get the best possible result at the bottom of the wound at the attachment of the trachea to the skin. The patient gained twenty pounds during the month following the operation, making a total of thirty pounds gained in weight since coming to the hospital.

I desire to state that the smooth and rapid convalescence of the patient was due to the untiring efforts of Doctor Smith and Doctor Lorie.

DISCUSSION.

DOCTOR R. BISHOP CANFIELD: I regret exceedingly that I was not present at the operation. I was extremely interested to read the history, to examine the specimen of the larynx, and to know that the operation terminated successfully.

Total removal of the larynx is infrequently attempted on account of the fact that in the past unsuccessful results have been almost universal. With the better methods of early diagnosis of carcinoma of the larynx and with the better operative technic in cases where the malignant growths have not infiltrated the surrounding tissues, a few satisfactory results have been secured. Here is a larynx that shows almost exactly the condition that was discovered before the operation, namely, a malignant growth involving both sides of the larynx and confined to its interior. It was perfectly clear to Doctor Plummer that nothing less than a total laryngectomy would be of any service.

I can do nothing but commend the technic used, but would suggest that if the dissection of the larynx from the surrounding tissues and esophagus is performed without tracheotomy and under local anesthesia, the entire operation can be carried out until one is ready to remove the larynx, before sectioning the trachea. At that time, with all the hemorrhage stopped and the patient in the semirecumbent position the trachea can be sectioned transversely, the lower end sutured immediately to the skin, while the larynx is packed with gauze. In this way danger of gravitation of blood into the lungs is avoided. Doctor Plummer accomplished this by keeping the head of his patient low. It is a fortunate thing that the operation was performed before the growth extended upward sufficiently to involve the base of the epiglottis. It would have been a very difficult thing to secure enough mucous membrane to form a flap sufficiently strong to separate the mouth cavity from the wound cavity. In such case it becomes necessary to pack the upper end of the wound until the entire cavity can granulate over, a procedure which is very slow and tedious. I am very proud that the doctor did this operation and secured the result he

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did. The photograph of the patient shows how eminently well satisfied he is with his condition. It was amusing to hear Doctor Plummer say that the patient told him he felt fine after his larynx had been taken out; he must have shown it.

Now comes the question of what shall be done to make it possible for him to speak? Can an artificial larynx be used to enable him to articulate plainly? A device was brought forward some years ago, one end of which is placed in the lips of the wound and the other brought externally to the patient's lips. Such a device is awkward, unsatisfactory, draws the attention of the public, and is not of much use. The patient can be taught to speak plainly by using his lips. He can be taught to make use of an explosive speech which is quite intelligible, consequently he does not become dumb.

It will be interesting to watch this patient for the next two or three years. We believe that a patient's tracheotomy life is about as long as his catheter life. If, then, this man has no recurrence we may expect in the ordinary course of events that he will live a couple of years. He has a very fair chance of remaining well as far as the malignant growth is concerned, since all that was involved has been removed. I saw several laryngectomies this summer, in not one of which do I think the patient will recover.

Doctor Albion W. Hewlett: This case illustrates the value of having a specialist at hand. The early diagnosis was tuberculosis. The stridor caused by the laryngeal obstruction confused the lung signs and the examination of the larynx did not at first reveal the true character of the condition. Tracheotomy was performed on account of the threatening laryngeal obstruction and the tissues removed gave the true diagnosis.

Doctor Plummer (closing the discussion): Perhaps he did not give voice to his feelings, but he certainly expressed them in every way possible for him to do. Before leaving the hospital he was able to make lip sounds and one could understand very well what he was trying to say. In fact the last time I saw him, I talked with him five or ten minutes and he was using his lips entirely and by sort of an explosive effort was able to make sounds that were very easily understood. He was very much pleased with his ability to do this and practiced it constantly.

A REPORT OF A CASE OF EXSTROPHY OF THE BLADDER WITH SPLIT PELVIS IN A WOMAN THE MOTHER OF TWO CHILDREN.

HARRY B. SCHMIDT, M. D.

Ann Arbor, Michigan.

(From the Obstetric and Gynecologic Clinic of the University of Michigan.)

The patient, Mrs. V. S., twenty-seven years of age, American, married, was admitted to the Gynecologic service of the University Hospital September 12, 1911. There is nothing of interest in her family history. She has three brothers, all living and in good health and one sister died in infancy. As far as the patient knows, there are no diseases of a chronic or hereditary character or abnormalities in the

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family. The patient and all others of the family are below the average height. Her husband is thirty-seven years of age and in good health.

Personal History.—The patient has had the measles, chickenpox, pneumonia at seventeen, and mumps this present year with good recoveries. She has been always fairly well and thinks that if it had not been for her deformity she would have always been strong and in very good health. She has done light housework and until recently has had very little discomfort on exertion. Before her marriage she danced considerably and without pain. Her husband knew her condition before he married her. Intercourse is not painful and she is very passionate. Her first menstrual period began at the age of eleven. She has continued regular ever since, twenty-eight day type, duration four days.

Patient is of a short, stocky build, with excellent muscular development and has a good form. She stands on the left leg when at rest, stooping slightly. She walks with a shuffling gait, carrying the left shoulder down. Physical examination is negative. There is no difference in the length of her legs.

The abdomen is slightly full and the umbilicus is not in its usual position. In the lower abdomen, beginning at the normal site of the umbilicus, there is a groove extending downward twelve centimeters. At this point, which is about the normal location of the mons, there is a soft swelling lying transversely, six centimeters long by three and five-tenths centimeters wide and one and five-tenths centimeters above the level of the surrounding skin. The skin above this line is depressed forming an irregular groove. Above this swelling is a scar, probably the umbilicus. Below, there is a moist red surface, resembling mucous membrane which is continually moistened with fluid having the odor of urine. There was no meatus found. The mouths of the ureters could not be seen. The swelling described above is separated from the vagina by a bridge of tissue one centimeter in thickness which is stretched tensely across the gap. On either side are labia covered with hair. These do not unite above but extend upward and outward, being separated by the cystic swelling above. The labia minora lie on the inner surface of the labia majora. At the upper extremity of the left labium minus is a small tag, probably the clitoris. No definite urethra can be made out. The pubic bones are not united, being separated by about seven centimeters. The external perineum is intact, the internal is torn, and there is some bulging of the anterior vaginal wall. The uterus is prolapsed and retroverted, and there is a laceration of the cervix. She was too tender for palpation of the appendages.

Patient was married at seventeen years of age. She has two living children in good health. The first child was born in 1903, one year after marriage. She came to full term much distended. The labor lasted thirty-three hours but no instruments were used. The child weighed six and one-half pounds with clothing. The second child was born in 1904. This labor was of three hours duration and the child weighed seven and one-half pounds with clothing. The mother made a good recovery after each labor.

Remarks.—Exstrophy of the bladder is not a very uncommon condition. It is more common in males than in females, the proportion be-

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ing nine to one. It has been observed that the greatest variation in this condition arises from imperfect development or the absence of different portions of the genital organs and that the amount of sexual desire seems to be in proportion to their perfection. The most interesting and remarkable facts about this case are that the patient has been married nine years to a man in good health and that she has had two children who are healthy and well. I can find but six cases reported in the literature up to the present time where women with this deformity have borne children. The first was reported by Bonnet in 1722; the second by Ayers in 1859; the third by Litzmann; the fourth and fifth by Gunzberg; and the sixth by Gusserow, in 1879. In the limited time at my disposal I have been unable to find any cases reported since Gusserow's case.

DISCUSSION.

DOCTOR DEAN LOREE: As Doctor Schmidt states, cases of exstrophy of the bladder are not uncommon. This patient came to the hospital while I was away and I did not see her. One patient came to the clinic last year, a male, and I think there have been six cases in all in the last ten years. There is probably no more deplorable condition than genital deformities and malformations, such as exstrophy of the bladder. I think that all the cases I have seen were in the male.

The operations for this defect may be divided into two classes; the older operations consisting entirely of plastic work and the later operations of transplantation of the ureter into the intestine. The old operation took a long time. The plan was to take flaps from the abdominal wall, the first flaps with the skin turned in to form a lining for the new anterior wall and after this graft had proved successful, other flaps were taken from the abdominal wall with the skin out. These flaps were to make the outer covering. There were necessarily a great many failures and the successful case required a long period of treatment. When successful the only end gained was a new anterior wall. At best the operation had its drawbacks. A perfect sphincter could not be secured. The new urinary opening constricted so that no matter how good an anterior wall was obtained there was incontinence, and more than that incrustations formed on the bladder wall, there was a great deal of irritation and the patient was very uncomfortable. Many otherwise successful operations were ruined because the newly formed bladder had to be opened to get rid of these irritating substances deposited on the walls of the bladder. The later operations for this condition have been more successful and probably will be even more so in the future, for no doubt many deaths resulted from poor technic.

Operations have been devised for transplantation of the ureters. Probably the most successful are those where a portion of the trigonum together with the ureteral orifice has been removed and transplanted into the sigmoid flexure. Many of these cases have been reported. In 1901 Hartley collected and reported forty-six such operations for exstrophy of the bladder with seven deaths, and not all of these from infection, which is most to be feared from the ascending involvement of

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the ureters and kidneys. Two or three of them died from surgical shock, probably the result of poor technic. I was much interested in the report of a case by Doctor Eaton of San Francisco. About a year ago he transplanted the right ureter into the appendix and got a favorable result. Last year in one exstrophy case I proposed to transplant the right ureter into the appendix and not do anything with the left for a time until the first operation was found to be successful. If not possible to secure a good result with the first ureter, then one would have the other ureter no worse off than before. If the first attempt was successful the other ureter could be transplanted into the bowel at a subsequent operation. In this way one might work with a little more security and be sure of one kidney's working. A case has been reported where the operator, not only transplanted the trigonum, but a large share of the posterior wall of the bladder into the sigmoid flexure with a successful result. I have not had time to look up the literature of more recent cases, but I have no doubt that many cases of exstrophy have been operated upon and reported since Hartley's paper in 1901.

Doctor George Kamperman: I think one thing should be remembered in the treatment of this patient. The operation should be such that the results shall not be upset or spoiled by future pregnancies. There is no reason why this patient should not become pregnant again and we would have to bear this in mind when operating to cure the exstrophy. I imagine the ureter could be well transplanted and not give trouble during future pregnancies or confinements, but probably some trouble would arise during the pregnancy if a plastic operation were performed on the abdominal wall.

Doctor Reuben Peterson: The patient, whose case has been reported by Doctor Schmidt, entered the Gynecologic service during the vacation, so I did not have an opportunity of examining her. Still, the case has interested me for two reasons, first, because of the experimental work bearing directly upon this subject, carried on by me some ten years ago; second, because the woman in this case, in spite of the malformations of exstrophy of the bladder and split pelvis, had given birth to two children. This latter fact seemed to me to be of especial interest and led me to suggest to Doctor Schmidt that he report the case and look up the literature of pregnancy and parturition in women with exstrophy of the bladder.

It must be borne in mind that patients with exstrophy are apt to die early from ureteral infection. Very few of them live to middle age, since in one way or another the exposed ureters become infected with resulting fatal pyelonephritis.

As regards operation for the relief of these unfortunates, it may be said that plastic operations on the whole have proved unsatisfactory. Failure is due to infection of the line of union by the decomposing urine. On the other hand Maydl's operation, consisting of the transplantation of the ureters with the surrounding trigonum into the bowel has proved highly satisfactory. As Doctor Loree has told you, Hartley has been able to collect forty-six cases with seven deaths, the latter not being due to ascending ureteral infection but to other causes. This

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was because the uninterfered-with ureteral openings were transplanted. I think I conclusively showed in my experimental work that pyelonephritis inevitably follows the transplantation of the severed ureter into the bowel. In dogs and in human beings the infection may be of such a nature that it may be recovered from for the time being. Usually, however, sooner or later the patient succumbs. Not so, where the ureter is transplanted with the trigonum. Here the results are very good, not only in human beings but, as I showed in my experiments, in dogs as well.

DOCTOR SCHMIDT (closing the discussion): The cases of females with exstrophy of the bladder in the literature are reported from the surgical standpoint; pregnancy is merely mentioned incidentally. I think if I go over the literature very carefully I may find some more cases, but as far as I know now those are the only ones that have been reported. The patient did not want the operation unless she could be sure that she could get relief from her condition.

PERINEPHRITIC ABSCESS RESULTING FROM PERFORATION OF A DUODENAL ULCER.

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MISS S., aged eighteen, student, entered the Surgical clinic of the University Hospital July 20, 1911, complaining of pain in the right upper quadrant of the abdomen, lameness and stiffness of the right side at the level of the waist line. With the exception of measles at fourteen and one atack of tonsillitis two or three years ago she has always been well until the begining of the present trouble about two weeks ago. She began to menstruate at thirteen and has always been regular till one month ago when she missed her period. Her family history is unimportant.

About two weeks before entering the hospital the patient noticed a slight lameness and tenderness on the right side just below the ribs. This grew gradually worse and two days later she consulted a physician who told her the pain was due to the missed period. He gave her some medicine to bring on the flow and also prescribed a counterirritant for the painful area. For about a week her condition remained about the same. She was able to be about the house but her appetite was poor and she thought she had some fever at times. She again consulted the physician and on the way home from his office became faint and felt very ill although she did not lose consciousness. On reaching her room she lay down and soon felt much better. During the following few days the pain became more acute at times and was made worse by attempts to move about the house. She also states that she had several chills during this time. She now consulted a second physician who advised her to come to the hospital.

When examined at entrance the patient complained of severe pain on the right side just below the costal margin. Palpation in this region

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revealed a rather indefinite mass extending about three inches below the ribs and reaching to the midline. The mass did not descend on respiration and could not be moved about. The area was very tender to the touch and there was considerable spasm of the rectus. The temperature at this time was 100°, pulse 110, respiration 30. Blood examination showed the hemoglobin to be 90 per cent, 4,480,000 red and 19,650 white cells. Urine negative. During the night the patient vomited a considerable quantity of greenish-yellow fluid. On the second day of her stay in the hospital, July 21, the patient's condition remained about the same but the temperature rose to 103° in the afternoon, pulse 120. The white blood count was now 22,700. During the night she again vomited a large quantity of greenish fluid.

She was operated on by Doctor Darling on the morning of July 22. An incision was made through the right rectus muscle and the abdomen explored. A mass, thought to be retroperitoneal, was found in the region of the right kidney. The incision was therefore closed and a second incision made in the lumbar region parallel to the costal margin. This was carried down by careful dissection until the lower pole of the right kidney was exposed. In separating the kidney from its fatty capsule an abscess cavity was broken into and a small quantity of very thick, creamy, greenish pus escaped. Drainage was left in place and the wound closed. Microscopic examination of this pus showed many colonies of cocci which did not stain with Gram's.

For two days following the operation the patient's condition remained about the same as before. She continued to vomit at intervals and still complained of much pain in the right side. However, the white blood count continued to rise. On the third day her condition became worse, she vomited more frequently and the vomitus began to have a fecal odor. The urine became very much reduced in quantity although its examination showed no abnormal constituents. On the third day she became much distended but was partially relieved by stomach washing. Her white count was now 3,6000 with 190 polymorphonuclears in a count of two hundred cells. She died on the fifth day after twenty-four hours of alternating periods of delirium and coma.

Consent for only a very limited autopsy could be obtained which was done by one of the interns. On the posterior surface of the first part of the duodenum was found an ulcerated area about the size of a copper cent at the base of which was a very small perforation. This perforation connected with an abscess cavity lying posterior to the upper pole of the right kidney and containing about two ounces of very thick, greenish-yellow pus. Section of the kidney showed that it contained a large number of small purulent foci. There was no generalized peritonitis and except for a very much dilated stomach there were no other abnormal findings.

This case is not reported because of its rarity for many similar cases are referred to in the literature and have been encountered by most surgeons of large experience. The fact that ulcer of the duodenum has no definite symptomatology and may remain latent without giving any symptoms at all is well illustrated by this case. It should be

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noted that the ulceration and perforation did not occur on the anterior peritoneal covered portion of the gut as in the majority of these cases and that there was very little if any leakage of the intestinal contents. It is also interesting to note that in spite of the fact that this kidney showed multiple purulent foci scattered throughout its parenchyma, at no time did the urine give any indication of such a process. The fact that this patient had always been regular in her menstruation to within two weeks before the symptoms of her illness began and then missed a period is interesting. It is possible that this was due to a hemorrhage from the ulcer but in this case the patient would have probably shown a secondary anemia which was not present in this case.

DISCUSSION.

DOCTOR CYRENUS G. DARLING: There was nothing in the patient's history to indicate the time when the perforation occurred. The abscess was well walled off and it would seem from its appearance that it had been formed some time previous to her entrance to the hospital.

The relation of this abscess to the kidney also presents some very interesting points; first, it probably penetrated the covering of the kidney, at least to such an extent that infection passed directly from the abscess to the kidney and that the abscesses found there were not due to a general infection. This kidney or the urine did not present any microscopic indications of trouble, no blood, no pus in the urine, yet in this kidney were found numerous foci of infection, pus, and one blood clot where the kidney was damaged at the time the opening was made. This shows that sometimes there may be infection in the kidney and also pus and blood present without being found in the urine. It would be interesting to know whether this kidney was active at the time, or whether its action was suppressed entirely. I took particular pains to locate this trouble, because when the patient was brought here the attending physician had made the diagnosis of appendicitis. In a number of these cases of perinephritic abscess one finds that the appendix is the point of infection; the tip of it may be turned back towards the kidney, infection occurring in this way.

Upon opening the abdomen there was found a smooth surface of peritoneum. I felt this mass through the abdominal opening, and while I did not have in mind a possible perforation from the stomach or duodenum as the origin of the abscess, I did not see anything in the abdominal cavity that would lead me to suspect that that was the point of origin. In making an opening behind I carried my finger deep into the wound until I felt a cavity, and withdrawing it, the pus followed; but this was only the lower side of the kidney and the opening had not been carried into the abscess above where it had found its way through into the structures surrounding the kidney. I do not know that we would have been able to do much for this patient even if we had found this opening. From its location it would have been very difficult to make any repair of the intestine; still if we had made a complete drainage of the abscess the chances of recovery probably would have been much better.

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DOCTOR PETTIS (closing the discussion): It is unfortunate that a compelte autopsy was not allowed in this case, for, under the circumstances, we are left in doubt as to the origin of the suppurating foci in the right kidney. This abscess involved the fatty capsule of this kidney, and it is quite likely that this involvement was due to direct extension of the process from this point. If the infection in the kidney took place by way of the blood stream we would expect to find similar lesions in the other kidney as well as in other organs. We have no pathologic report to settle this point.

A REPORT OF A CASE OF PUBIOTOMY FOR FACE PRESENTATION.

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(From the Obstetric and Gynecologic Clinic of the University of Michigan.)

I DESIRE to place the following case on record not only because of the rarity of the treatment instituted but because it will throw some light upon what may be accomplished by the comparatively new operation of pubiotomy.

Mrs. B. W., obstetric number 616, aged twenty-two, a full term primipara, went into labor early in the morning of September 24, 1911. Although she had continuous pains throughout the following twenty-four hours, her physician, Doctor Neal A. Gates, was not summoned until 1:30 the next morning. Examination showed a face presentation with chin to the right and posterior. The patient was anesthetized and an unsuccessful attempt made to push the head upward with the idea of doing a version. She was admitted to the Maternity hospital at 4:30 A. M. At this time, the cervix was fully dilated, the membranes ruptured, and the head immovably fixed in the pelvis with the chin to the right and posterior.

I saw the patient first about 5 o'clock and decided upon pubiotomy which was performed soon afterward.

With the patient in the lithotomy position, an inch and one-half incision was made over the right pubic bone inward from the pubic spine. After carrying the incision down to the bone and excising the periosteum, with the finger in the vagina as a guide, a Bumm pubiotomy needle was passed downward hugging the pubic bone closely until the point was made to pass out through the upper and outer part of the right labium majus. The latter was drawn to the right so that the needle point would avoid the labial venous plexus. The Gigli saw was threaded into the eye of the needle and the latter withdrawn. The pubic bone was severed without difficulty. Following the division of the bone and withdrawal of the saw there was a slight hemorrhage which was easily controlled by sponge pressure. Forceps were now applied according to the sides of the pelvis, the fragments of the pubic bone being allowed to separate about three to four centimeters. The head was drawn and pushed down and after two or three applications of the forceps blades to the fetal head, the chin was successfully

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rotated under the symphysis and the head delivered by flexion. The child, a girl, was easily resuscitated. There was a slight abrasion of the mucous membrane at the outlet of the vagina but no perineal laceration. There was a vaginal tear communicating with the pubiotomy incision. Its edges were sutured with catgut and a small gauze drain inserted along the line of incision. The severed edges of the pubic bone were brought together closely and held firmly by means of bands of adhesive strips. A temporary Bradford frame was improvised out of an ordinary hospital stretcher. The pubic incision was closed with silkwormgut sutures.

The patient has made a most satisfactory convalescence. There has been some elevation of temperature evidently connected with the pubiotomy wound for the lochial discharge has not shown any signs of sepsis. There was some edema of the vulva and inability to void urine. These symptoms were never marked and soon ceased. The patient was removed from the frame on the twelfth day and allowed to turn on her left side two days later.

Examination of the baby the day after birth showed marks of the forceps blade on the right side of the neck and paralysis of the right arm. At first the arm was completely limp, but it has improved steadily up to the present time until now there is considerable resistance manifested when attempts are made to move the arm.

Careful measurements of the baby's head ten days after birth showed it to be of the dolichocephalic type, possibly explaining the presence of a face presentation in this case.

In face presentation with an unrotated fixed chin posterior, the choice lies between craniotomy and pubiotomy with, of course, the preference given to the latter if the child be living. Abdominal Cesarean section is contraindicated because of previous attempts at rotation from below and because of the difficulty of extracting a fixed head from above.

It was certainly very gratifying to observe the comparative ease with which the chin was rotated up under the pubes after the pubic bone was separated and would lead me to select the operation again under similar circumstances.

DISCUSSION.

DOCTOR CARL D. CAMP: Brachial birth palsy is probably as old as forcible intervention in obstetric practice. Smellie described, as long ago as 1768, a compression paralysis of the arm, occurring at birth, in a case of face presentation delivered with forceps. It occurs about once in two thousand labors, according to Duvall, and often occurs in highly skilled hands, as in the case of Emperor William, of Germany, on which occasion Sir William Jenner was the accoucheur. Duchenne described the condition at some detail in 1862, but the nature of the lesion causing the paralysis was not definitely known at that time. Two classes of cases were then recognized; those that recovered promptly and were, I believe, correctly attributed to pressure on the brachial plexus by instruments; and a second class which, though often apparently less severe than the first, showed but little

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tendency to recover. These latter cases were thought to be due to injuries to the bony parts, separation of the epiphysis, et cetera. In 1897, Fieux published an essay in which he reported experimental work which led him to believe that overstretching was the chief cause of brachial birth palsy. Clark, Taylor and Prout believe that the paralysis is due to an overstretching and tearing of the nerve. They performed some experiments showing that when the head and shoulders are pushed apart the brachial plexus is under tension and may be torn, first, the fifth cervical nerve, then the sixth and so on. This occurs if the shoulder is obstructed either at the brim of the pelvis or at the symphysis, or if the head is rotated or oscillated, or in a breech presentation when the fingers are hooked over the back of the neck and the shoulders are pulled down to deliver the after-coming head. Taylor says that "forceps cannot be a factor of moment because the blades will not reach as low as the site of the lesion, when traction is applied." In this I think he is wrong. In the case presented by Doctor Peterson this evening, the forceps reached low enough to press on the brachial plexus as shown by the mark on the child's neck. I believe that there is a different etiology for the first two classes of cases. In the first the etiology is pressure, the paralysis is widespread, involving the whole arm but clears up rapidly, as is usual in cases of pressure palsy. In the second class, the etiology is tension, the nerve is torn, the paralysis is more limited in extent but, owing to the development of cicatricial tissue within the nerve sheath, it is a permanent paralysis. The clinical differentiation between these two classes cannot be made definitely within the first few months or so, but it is reasonable to suppose that the laceration would be attended by considerable pain in the nerve and the infant would be peevish and fretful, whereas in the pressure paralysis there is usually little or no pain. The pressure paralysis will recover completely in from three to six months and sensory and trophic symptoms are not marked. In the laceration cases the paralysis, while it may show some improvement, does not recover and trophic changes occur. These latter cases have been operated upon successfully by the exsection of the injured portion of the nerve. Kennedy counsels operation at the end of three months but Clark and Taylor prefer to wait a year, using in the meantime such measures as massage, electricity, et cetera. Taylor has operated upon a child ten years old, paralyzed from birth, and obtained remarkable improvement even at that age. The site for the incision in this operation is shown in a drawing made by Doctor Cummings (Figure I.) This drawing shows the position of the nerves and how a rotation of the head or pushing the head to one side can put them under tension. The lesion which results is usually located at about the point where the fifth and sixth nerves join.

With regard to the prognosis in the case under discussion, it is too early as yet to give a definite opinion. The fact that the arm can be drawn across the chest means nothing in this connection because that movement is brought about by the pectoralis muscles. Also the opening and closing of the hand shows only that the lower part of the brachial plexus is intact, whereas it is in the upper cords that the lesion

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is usually located. The really important test is the paralysis of the upper arm muscles.

DOCTOR GEORGE KAMPERMAN: This is a very interesting case because of its rarity. It is the first operation of the kind that has been performed in this clinic. While pubiotomy is not entirely new, the intense interest now shown in it is comparatively recent. Williams, of Baltimore, has probably done more than anybody to popularize it in this country.

I think it would be safe to say that in a way the results of pubiotomy have been disappointing. When first advised in this country the enthusiasm concerning it was so great that it promised to supplant Cesarean section. Later reports made one more conservative as far as the use of the operation was concerned. We now think that cases

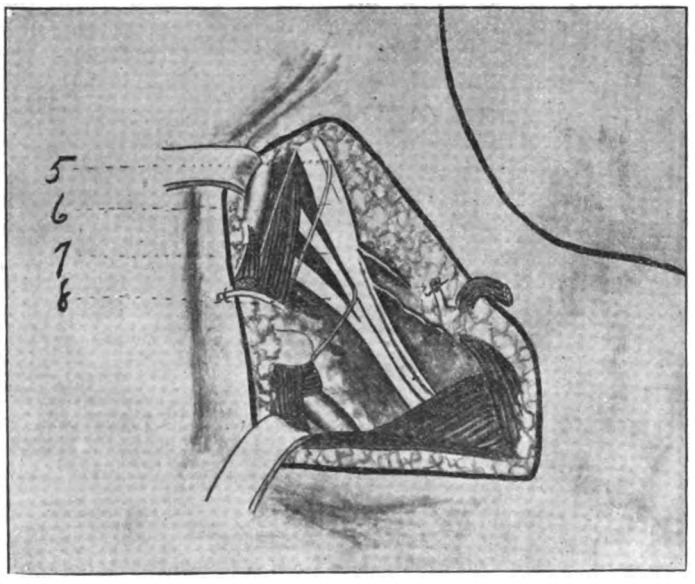

FIGURE I.—Brachial Plexus.

for pubiotomy should be carefully selected, and this would naturally narrow its field a great deal. Obstetricians have long been looking for some means to deliver patients with contracted pelves who had been infected by previous attempts at delivery. It was hoped that pubiotomy would prove to be a safe operation whereby these infected patients could be delivered. But with further experience this hope had to be abandoned. The morbidity following pubiotomy on infected cases was too great. Pubiotomy should be a primary operation and should not be resorted to simply after everything else has failed. The patient should be clean and not infected, and this would narrow its field of usefulness to a limited extent. There are no doubt many cases in which it is indicated, yet it is not the operation that will do everything that obstetricians at first thought it would do.

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One interesting thing in the postoperative history, the cause of which has never been explained, is the occurrence of abdominal distention. That was the case with this patient, and Williams sees it frequently in his cases also. It is quite easy to see how an abdominal operation should be followed by tympanites, but in pubiotomy, the abdomen is not opened and the tympanites is hard to explain. Most likely the operation has nothing to do with the paralysis the latter being due to the position of the head (face presentation), or perhaps to the forceps delivery. The cutting of the pubic bone has probably no relation to the paralysis.

DOCTOR HOWARD W. CUMMINGS: I am much interested in this case from the standpoint of the after treatment. On the fourteenth day the patient was taken off the Bradford frame. These patients formerly were kept on the frame for about four weeks and treated much like ordinary fracture cases. On the fourteenth day this patient was turned on her side; on the twenty-first day we expect to get her up, and have her walking on the twenty-fourth day. This is the way Williams treats his patients now and it seems to work out very well.

DOCTOR CYRENUS G. DARLING: I think this case illustrates very clearly the danger which may come from the use of the forceps and the value which may accrue from surgical interference in obstetric practice. Anyone who has used the forceps cannot but be impressed with the possible dangers which may result from their employment and will be more and more inclined to resort to them less, or indeed to get along without them entirely. The value of surgical interference in many of these cases is rapidly becoming appreciated and it is right that it should be so. The lives of a great many children can be saved by surgical interference, and in many instances there will be a saving of the mothers as well.

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TRANSACTIONS
OF THE
CLINICAL SOCIETY
OF THE
UNIVERSITY OF MICHIGAN

STATED MEETING, NOVEMBER 1, 1911.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.

REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS.

A REPORT OF A CASE OF TWIN PREGNANCY WITH SEVERE EDEMA OF THE VULVA AND LOWER EXTREMETIES DUE TO PRESSURE.

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EDEMA occurring in pregnant women is by no means uncommon, and this case report is only justified because of the unusual findings and termination.

Mrs. N. P., a primipara, aged twenty-five, was admitted as an emergency case on the evening of October 6, 1911. Prior to her arrival her physician had telephoned that he was about to bring a case of eclampsia to the hospital, consequently everything was in readiness for the rapid evacuation of the uterus by vaginal Cesarean section. Upon arrival, the patient was examined by Doctor Peterson. She was not clear mentally. Her skin was pale and dry but she showed no edema of the upper part of the body. There were no convulsive movements or muscular twitchings; however, her physician reported an attack of a mild convulsive character, prior to her admittance. The patient did not complain of headache but seemed drowsy. The abdomen was markedly distended; palpation was not satisfactory because of rigidity and a distended bladder. However, a fetal heart could be heard on the right side, near the umbilicus, the rate being 144 beats

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per minute. The vulva was so edematous that the patient could not adduct the thighs, hence it was difficult to get her through the doorways at the maternity ward (Figure I). The labia majora were so distended that they appeared shiny and glistening and seemed ready to burst. There was fluid exuding from the edematous labia. Both lower extremities also were greatly enlarged by edema. The patient's blood pressure taken with the Faught instrument was recorded as 138 millimeters of mercury. The patient had not voided urine in twenty-four hours and had not defecated for several days.

There was nothing important in the patient's history up to the time of pregnancy. Her pelvis was of normal size. She did not know the

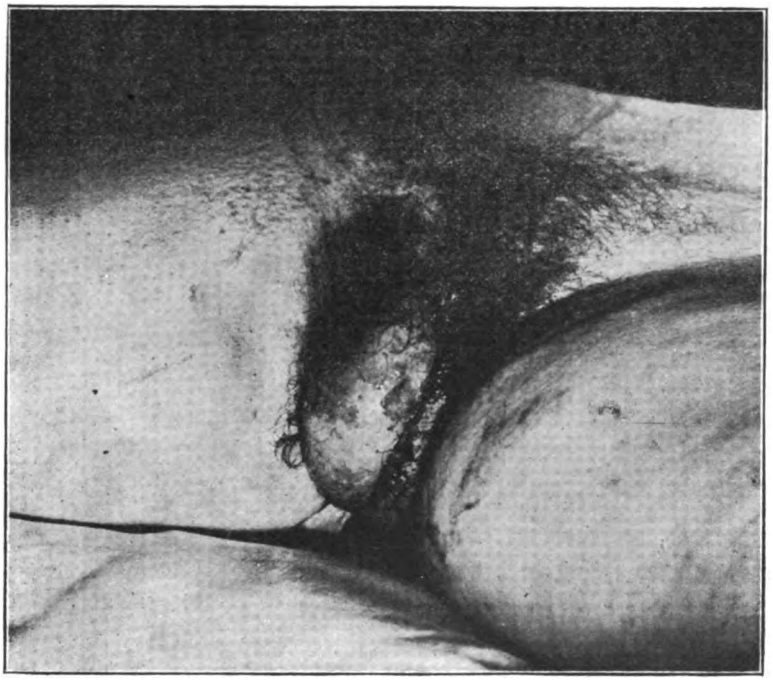

FIGURE I.—Edema of the Vulva in a Pregnant Patient.

date of her last normal menstrual period, but evidently she was at full term. The early months of pregnancy were uneventful and only within a few weeks previous to her entrance into the hospital had she complained of slight edema, visual disturbances, backache, vomiting and marked constipation. Her temperature was 98.4°, pulse 112, respiration 26.

After a careful consideration of the case, it was decided that a vaginal Cesarean section would be almost impossible while such marked edema of the vulva existed. The patient was not in an extreme condition and an attempt to aid elimination was thought to be the best plan.

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An effort to empty the bladder with a catheter proved a failure because of the distortion of the parts.

The patient was surrounded with hot water bottles. An improvised electric stove was placed between her abducted thighs and the bed was covered with heavy blankets. She was given one-eighth grain of elaterium every hour for four hours.

At midnight, her skin felt moist and she voided a large amount of urine into the bed. About 1 A. M. the patient began to complain of severe pains in the lower lumbar region. These came at regular intervals of about five minutes. At 2 A. M. the patient was perspiring freely and soon after this voided urine again. At 3 A. M. the patient was having severe labor pains. Because of the edema it was impossible to prepare the patient for delivery. One hour later, meconium was noticed escaping from between the swollen labia. After a few pains the buttocks appeared at the vulva. The patient was given a little chloroform. No attempt was made to deliver her in the lateral position and she was delivered in the dorsal position. When the umbilicus had appeared at the vulva the cord was drawn down, the child's back being toward the patient's right side. The arms were drawn down, one finger was inserted into the child's mouth and the occiput was rotated under the pubic arch. The head was extracted by the Smellie-Veit method. After the cord was clamped and cut it was noticed that the fundus was unusually high. An examination disclosed the presence of another child. After a ten-minute interval there was a second gush of amniotic fluid and soon a second child presented at the vulva by the breech. Its position was S.L.P. This child was extracted in the same manner as the first, except that the occiput could not be rotated under the pubic arch so the chin was pulled down under the symphysis pubis and the occiput was delivered over the fourchette. The infants were easily resuscitated. They were females each weighing about six pounds. The placentæ had two distinct amniotic sacs and a chorion between them. There was a small accessory lobe of placental tissue between the two larger placentæ.

At the time of confinement there was a slight laceration of the left labium majus which caused the edema to disappear rapidly. On the second day of the puerperium the edema of the vulva had disappeared, the patient was voiding large amounts of urine showing but a trace of albumin; her bowel movements were frequent and she felt unusually well. On the fourteenth day the mother and children were discharged in excellent condition.

The case is interesting because of the rapid changes in the clinical picture. At 10:30 P. M. the patient was in a serious condition, characterized by very poor elimination of waste products, with extreme edema of the vulva and lower extremities. At 8 A. M. she was eliminating well and the edema had nearly disappeared. Pressure of the greatly enlarged uterus upon the pelvic brim and abdominal organs is the most

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plausible explanation of the condition. This pressure interfered with the return venous blood from the legs and vulva; it also interfered with evacuation of the bladder and rectum and possibly by altering the kidney circulation caused albumin to appear in the urine.

The frequency of intoxication in cases of multiple pregnancy has been noted by many authors. Olshausen[1] and Cassamayor[2] state that twin pregnancy and hydramnios are predisposing factors in eclampsia. From six to eight per cent of their cases of eclampsia had twins as an etiologic factor.

Manton[3] is of the opinion that the theory of eclampsia being due to toxic products originating in the fetus and altering metabolism is borne out by the fact that twins predispose to eclampsia and death of a fetus in utero diminishes the chances of it.

Peterson[4], in a recent article upon vaginal Cesarean section, concludes that "multiple pregnancies are much more common among eclamptics. Twins are four and one-half and triplets ten and one-half times more frequent in this complication. Therefore multiple pregnancies probably act as a contributory cause of eclampsia."

Albuminuria occurring in cases of multiple pregnancy is probably the rule rather than the exception. Playfair[5] explains this by saying that "it is due to undue arterial tension consequent on pregnancy."

Hirst[6] says "albuminuria in the mother is the rule in multiple pregnancies."

In eighty-one autopsies of eclamptics Herzfeld found eighteen cases of compressed and dilated ureters. This may account for the albuminuria.

Edema of the vulva is not uncommon in prolonged labors. Hirst[7] reports a case of edema of the vulva and beginning gangrene due to prolonged pressure in obstructed labor. It is a well known fact that edematous tissues lose their elasticity, give rise to tears and subsequent gangrene. Williams[8] states that in twin pregnancies the patient may suffer from dyspnea, pressure symptoms and edema. He also holds that edema of the vulva and lower extremities often results from pressure excited by the enlarged uterus upon the veins returning from the legs. Ehrenfest[9] believes that edema of the labia is due to a general pelvic congestion. Budberg[10] has suggested that edema of the labia and perineum tends to prevent a laceration during labor.

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DISCUSSION.

DOCTOR LESLIE H. S. DE WITT: The presence of albumin in the urine is much more frequent in multiple than in single pregnancies. Some even go so far as to say that albumin is always present in cases of multiple pregnancy. There are several factors entering into the etiology of albuminuria. First, it may be due to the overdistention caused by the presence of more than one child. Second, pressure upon the ureters at the brim of the pelvis, also pressure directly upon the kidneys. Third, it may result from renal insufficiency, that is, the inability of the kidneys to eliminate for two. The adherents of the placental theory insist that the increased area of placental attachment gives rise to a greater number of toxins absorbed by the blood and this acts as the causative factor. In proportion to the albuminuria, edema is found to be present.

Doctor Peterson, in his paper on vaginal Cesarean section for eclampsia, has compiled twenty-two hundred eighty-two cases of eclampsia. Of these, multiple pregnancy was found in five and eight-tenths per cent or one out of every nineteen cases, while one out of every eighty-nine normal cases develop it.

When this patient came to the hospital the question arose as to whether she was toxemic. It was thought not, because of the absence of the clinical symptoms of toxemia, particularly headache which is a cardinal symptom in eclampsia. The headache in this condition is so typical as to be classed as an eclamptic headache.

DOCTOR REUBEN PETERSON: The only death from eclampsia in the maternity ward during the past ten years occurred in a woman with twins. In this case the diagnosis of twin pregnancy had not been made prior to labor. After being in labor a short time she developed eclamptic symptoms which led to the rapid evacuation of the uterus. An hour after the delivery the patient went into convulsions and died in spite of all eliminative treatment. The autopsy showed both ureters dilated to the size of the thumb and typical eclamptic lesions in the kidneys, liver, and brain.

As has been mentioned, in my paper on vaginal Cesarean section I have shown from the five hundred and thirty cases studied, how much more frequent eclampsia is in multiple pregnancies.

In the case reported this evening it did not seem to me as if the woman was in a very serious condition when brought to the hospital. She was very edematous, especially about the vulva and lower extremities but symptoms of intoxication such as intense headache and blurred vision were lacking. In case she had had convulsions and it had become imperative to empty the uterus the nature of the operation would have had to be determined. With such enormous distention of the vulva vaginal Cesarean section would have been out of the question. In fact any operation from below would have been difficult. Under these circumstances abdominal Cesarean section would have had to be considered, in spite of the fact that this operation for eclampsia has

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been attended with a very high mortality. At present I am engaged in a research work on the subject of abdominal Cesarean section for eclampsia. While I am not prepared to make a report at the present time I think it will be found that if the moribund patients be eliminated the mortality from the operation will not be as high as has been supposed. One American operator has had thirty-three cases with only three deaths. One objection to the operation is the tendency of the uterine wound not to heal owing to the eclamptic condition of the patient. In the majority of cases the operation has been limited to cases of contracted pelvis where the woman could not be delivered by the subpubic route.

Doctor Howard H. Cummings (closing the discussion): I meant to have stated that the picture gives a very poor idea of the condition of the vulva, but does give some idea of the edema of the legs which was very marked. One labium is almost of normal size. That is the one that had the tear at the time of labor. A couple of hours after the birth it was almost of normal size.

The surgical treatment, where operative means are necessary by way of the vagina, is by multiple incisions in the edematous vulva. This results in a return to the normal size, when it is possible to operate from below.

This patient felt perfectly well the next morning, in fact, as well as any patient after a normal confinement. The puerperium was uneventful in all respects.

CALCULOUS ANURIA.

Doctor Dean Loree read a paper on this subject, the following being an abstract thereof:

The striking characteristic of calculous anuria is the length of its tolerant period with a total absence of subjective symptoms, which causes a critical condition to go unheeded. The surgeon must not delay operation through hopeful but misleading signs. The spontaneous cures are from twenty per cent to twenty-eight per cent as against fifty-one per cent of operated cases.

Why uremia is delayed or what toxins produce it are not known. It is clinically apparent that the kidney does not produce urine when occluded, unless occlusion be intermittent. If excretion is inhibited, what part then, does secretion play in prolonging life?

Those who withstand the longest periods of anuria with tolerance have the fewest complications before the attack.

As to the condition of the kidney opposite the one last occluded, calculi are found more often than reflex inhibition, congenital absence or renal diseases foreign to calculus.

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In diagnosis, the Roentgen ray is the most valued agent. The stiletted ureteral catheter and the Roentgen ray will not only locate the calculus, but give information as to the point of surgical attack. Much reliance is placed on pressure pain with muscle spasm. The proofs of hysteric anuria can be fairly easily established. The evidences of calculus causing anuria are also of a conclusive character.

The prognosis becomes graver the longer anuria exists. Coma further complicates the matter. The object of the treatment should be the removal of the cause. If there is unilateral calculus proceed to the performance of nephrolithotomy or ureterolithotomy. If uremia is manifest, nephrotomy is sufficient for kidney drainage, leaving the stone to be removed at a subsequent operation, if it does not pass. If both ureters are occluded perform bilateral nephrotomy.

DISCUSSION.

DOCTOR REUBEN PETERSON: I have very little to add to Doctor Loree's most excellent and exhaustive paper. However, I wish to place on record a case which must have been at one time one of calculous anuria. The patient gave a history of an attack of renal colic with suppression of the urine. Finally she passed a calculus accompanied by considerable blood. Several months ago she had an attack of pain in the right side and another attack a month ago. I opened the abdomen for the removal of an adherent dermoid completely filling the pelvis. Palpation along the course of the right ureter showed no calculus. Following up the palpation we were unable to find any traces of the right kidney. The gall-bladder was filled with two hundred fifty small calculi. These were removed and the patient is making a good recovery. This is the first time in the course of a number of thousand abdominal sections, I have found a kidney absent, although I have run across two cases of horseshoe kidney. The kidney on the left side did not feel larger than normal. In this case it would be very easy for calculous anuria to occur. Perhaps one of the most interesting points brought out by the essayist is the length of time some patients will have calculous anuria without uremic symptoms and yet ultimately recover.

DOCTOR DEAN LOREE (closing the discussion): Doctor Breakey asks whether any effort was made to catheterize the ureters after the passage of stones. This question is certainly very pertinent. I was desirous to again cystoscope the patient before he returned home, but as he had three times submitted to such an investigation, besides undergoing two nephrotomies, he declined.

Calculous anuria is a very uncommon disease. Kummel, in a recent paper, reports but six cases. Doctor Braasch, in a personal interview, stated that to his knowledge there had never been a case in the Mayo clinic.

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REPORTS OF CASES.

A CASE OF CONGENITAL DILATATION OF THE COLON.

DAVID M. COWIE, M. D.
Department of Medicine.

THE case I wish to present this evening is that of a little girl of eight years with congenital dilatation of the colon. The child has complained of but few symptoms, namely, constipation from early infancy with attacks of extreme distention of the abdomen, and at times characteristic air hunger with cyanosis. The child has had practically no normal bowel movements since birth. The abdomen may be said to be in a constant condition of marked distention but there are times when this is so great as to lead one to speak of it as an attack. It is at these times that she becomes cyanotic and gets relief by being carried into the open air.. After the patient entered the hospital we did everything possible to reduce the distention so that the morning the picture was taken the abdomen was flat giving me the first opportunity for careful palpation. Air was then introduced by means of a rectal tube and bulb and the abdomen distended to the degree shown in the picture. During this distention the apex beat was displaced from the third to the second interspace. The distention produced no distress. When I first saw the patient, peristaltic waves the size of a large orange could be seen traveling from left to right over the epigastrium. At one time I thought a wave traveled in the reverse direction.

From the slides it will be seen that we are dealing with an enormously dilated colon which can be traced from the sigmoid around to the hepatic flexure and down into the ascending colon, the greatest dilatation being in the descending colon and sigmoid. There is what may be called a balooning of the rectum and sigmoid, for whether this is empty or full of feces there is always a characteristic bulging of the abdomen just above and mostly to the left of the pubes. Aside from the enlarged colon palpation is negative.

It may be briefly stated that these cases of congenital dilatation of the colon fall into two classes. Those due to a congenital elongation of the descending colon which does not grow in proportion to the body so that in later childhood or adult life it is about the normal size, and those due to some congenital deformity in the rectum or sigmoid bringing about a certain degree of stenosis without marked obstruction of the bowel.

A word about the frequency of this affection. Up to 1896 only twelve cases had been recorded. Hirschsprung recorded his first cases in 1888. In 1889 Griffith, of Philadelphia, collected twenty-four cases and since this time cases have been recorded with greater frequency so that at the present time there must be in the neighborhood of seventy or eighty cases if not more on record. This does not mean that the condition is necessarily so rare but rather that the disease has not been recognized. Many of these children die before reaching the second

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year. No autopsy having been performed the diagnosis of some other condition is doubtless given. In all cases of severe and prolonged constipation in infancy and childhood congenital dilatation of the colon should be borne in mind.

The question now arises what can be done for a patient like this. Treves has successfully removed the entire colon. His is the one case of congenital dilatation of the colon on record, I believe, which survived this operation. I should propose an enterostomy between the cecum and the upper portion of the rectum or lower portion of the sigmoid, the idea being to sidetrack the colon with the hope that the feces would pass directly into the rectum and not accumulate in the large bowel, thus overcoming the constant distention. Nevertheless there would still be an opportunity for fermentation to produce distention. However, the operation has been performed with reported success in chronic constipation in adults. The enterostomy having been done, a second operation for complete removal of the colon could be performed with less risk.

In presenting the case in the clinic the question was raised as to what effect an enterostomy at this point might have on pregnancy in later years. Doctor Peterson can answer this question for us. Probably it would have no effect.

The medical treatment consists in determining the character of the fermentation, subsequent careful regulation of the diet, and bowel irrigations intelligently given. Cathartics seem useless.

DISCUSSION.

DOCTOR CONRAD GEORG, JR.: I cannot speak regarding the surgery of the colon from personal experience. Connell, of Wisconsin, recently read a paper on this subject of dilatation of the colon. It cannot be told whether the good results of his operation will be lasting, but in about a dozen cases he has had favorable results. Of course, if the stricture is down in the rectum or rectal valves it should be relieved by dilatation of the stricture and valvotomy. In Connell's cases, in addition to Lane's kink, which is a kinking of the ileum just before it enters the colon, there was a membranous pericolitis. The ascending colon tends to drop down into the pelvis, causing a condition of enteroptosis and he found also a condition of pericolitis which resulted in the formation of a rather broad band of adhesions which were united to the retroperitoneum at the promontory of the sacrum below. This prevented the colon from moving out of the pelvis. He noticed in these patients, in some of whom the appendix had been removed for chronic appendicitis, that the patient after the operation was no better and still suffered from chronic constipation and other symptoms accompanied by pain in the abdomen. In one case he made a careful survey of the colon and found that it was in an abnormal position down in the pelvis. This was due to a band of adhesions, a pericolitis, also a kinking in the ileum. He twisted the band into a cord, then sutured the cord to the

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muscles in the abdominal wall, thus lifting the colon out of the pelvis and tending to hold it up to its normal position. Some of these patients have remained well for a couple of years, but whether the operation will be a permanent success is problematic.

Doctor Reuben Peterson: These cases of dilatation of the colon, whether congenital or acquired, are interesting. I, also, have watched the reports of Lane's operation with much interest. It seems surprising that the entire colon can be removed and no bad results follow. Doctor George H. Noble, of Atlanta, reported in 1909 before the American Gynecological Society some twenty-five or more patients where he had anastomosed the ileum with the sigmoid for constipation and mucous colitis. About seventy-five per cent of the patients were cured. So I see no objection to the same operation in this patient, as proposed by Doctor Cowie.

Pregnancy probably would have no injurious effect after such operations. After intestinal anastomoses and in the presence of many intestinal adhesions the intestines take care of themselves when pregnancy supervenes.

Doctor Dean Loree: There is an objection to the operation of short-circuiting the colon. It is a question how long the enterostomy will persist. Artificial openings of this character are generally permanent only so long as there is obstruction. A gastroenterostomy without pyloric obstruction is not a permanent affair, and when we come to view such operative fields, as we are at times permitted, at subsequent operations, we find the stomach and bowel walls healed separately. It is my opinion in this case the same condition would ensue unless there be obstruction distal to the opening. It might possibly persist for a sufficient time to cure the condition. I think the question of the operative condition interfering with subsequent pregnancy need not be considered.

Doctor Albion Walter Hewlett: These marked cases of congenital dilatation of the colon are quite uncommon. I was under the impression that they were due to a lack of tone in the colon. The ideal operation would be an excision of the entire colon. This has been done in a few cases with good results. It is not an easy operation, and I have seen it terminate fatally. The entire colon may be removed without marked physiologic disturbances following. Some years ago Doctor Erlanger and I worked on dogs from which seventy per cent of the small intestines had been removed, and we were unable to find any marked disturbance of absorption unless considerable quantities of oil were given. On a carefully selected diet they lived quite as well as normal animals.

Doctor Cowie (closing the discussion): I did not intend to consider the subject of dilatation of the colon in adults, which is not uncommon, but particularly that form in children known as congenital idiopathic dilatation of the colon. For this condition there may be a congenital defect of the rectum or the lower portion of the sigmoid as I have

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mentioned before. This point must be cleared up in the case I have presented. Rectal examination showed a rather indefinite projection as high up as I could reach with my finger, about three to three and one-half inches, which felt like a fold in the rectum. These folds are sometimes mistaken for "rectal valves." The child did not remain long enough for further examination under ether.

According to the reported cases it may be said that the patients seldom live beyond the second year and those who survive this age rarely live beyond the twentieth year without surgical interference.

TWO CASES OF EXOPHTHALMOS.

WALTER R. PARKER, M. D.
Department of Ophthalmology.

I shall present two cases of orbital growths, one a cyst, the other a tumor, probably a fibrosarcoma. Both patients presented themselves in the Ophthalmologic clinic during my absence and I am indebted to Doctor Slocum for the histories from which these abstracts are made.

Case I.—Male, aged thirty-six, American. Family history negative. Twenty years ago patient was shot with a revolver. The bullet entered the pinna on the posterior surface at its juncture with the head. The patient thinks the bullet did not lodge. Two months ago he noticed a throbbing sensation in the right eye. There was no pain, but there was occasional diplopia. Later there was pain, swelling, and loss of vision.

Present condition: Lids ecchymotic, conjunctiva injected and edematous, sclera slightly injected. Pupil reflexes normal, pupils equal, four millimeters. Iris slightly off color. No paralysis of the extraocular muscles. Marked exophthalmos, right eye displaced outward, downward and inward. Fundus examination: Media clear, disc swollen about two diopters, retinal vessels tortuous, retina edematous. A cystic tumor in the orbit at the external angle could be plainly felt.

A radiograph showed the patient to be mistaken in regard to the lodgment of the bullet. It was present, and had divided, one part having lodged near the ramus of the jaw, and the other near the inner insertion of the zygoma.

To determine the character of the contents of the cyst, Doctor Slocum aspirated it and sent a sample of material obtained to the Pathologic laboratory for examination. Report—mucoid material, no bacteria.

We had to deal with a cyst (possibly dermoid) or a retention cyst due to necrotic changes following injury to the orbital wall at the time of the accident.

Operation: A facial incision was made curving up over the external angle of the orbit. The cyst presented in the wound and was easily opened and evacuated. I was unable to remove the entire wall but removed a piece for examination to see if it contained any skin

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elements so as to determine whether it was a dermoid or due to inflammation. A portion of the external orbital wall was exposed and necrotic. All the contents of the sac were carefully removed and the exposed bone curetted.

The piece of sac removed together with some of the contents of the cyst were sent to the Pathologic laboratory for examination.

Pathologic report.—Infiltrated mass of scar tissue. Fluid contained albumin, lime salts, which possibly resulted from bone necrosis.

Undoubtedly the piece of the bullet that is lodged below, passed

FIGURE I.—Orbital Cyst.

along the orbital wall, and the resulting injury has lead to a necrotic process, producing the cyst.

This photograph (Figure I) shows the appearance of the patient before the operation.

Case II.—Male, aged thirty-three, American. Family history negative. Two years ago the patient noticed a slight irritation in the right eye. Six months later he first noticed that the left eye was slightly more prominent than the right. This exophthalmos gradually increased until now the left eye protrudes seven millimeters more than the right. Vision has been but slightly disturbed. Tension, oculus dextra, twenty-one millimeters of mercury; oculus sinistra, twenty-seven millimeters. The globe is displaced outward, forward, and downward. There is no

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diplopia. The exophthalmos was not reducible. There is no bruit nor evidence of acute inflammation. At the upper inner angle a somewhat movable tumor could be felt.

The first question to determine in this case is whether the growth originates in the orbit or extends from the sinuses. This is a very difficult question to answer, especially if we have to deal with a mucocele of the ethmoids or frontal sinus, as mucus does not have a shadow when transilluminated and the nasal examination may be negative. In this case there was a slight shadow of the frontal, but an exploratory operation revealed the sinuses to be normal. In this connection I wish to refer to the case of orbital tumor shown in this photograph (Figure II). An exploratory operation revealed not only the frontal but ethmoid and antrum on the side of the orbital growth, together with the frontal on the opposite side, all involved in a mucocele. The orbit is separated from the ethmoid by a very thin lamina, so any great pressure will sometimes fracture the bone and push it up, hence on palpation one feels the bony plate which gives a much harder feel than a cyst or mucocele would. A Killian operation was done by Doctor Plummer and recovery was uncomplicated.

Severe trouble from the sinuses having been eliminated in the case here reported, the tumor must be of orbital origin.

The location of an orbital tumor may be determined in a general way by the character of the exophthalmos. If the tumor be situated in the muscle cone, or at the apex of the orbit, the globe will be pushed directly forward. If situated in other locations, the globe will be displaced in an opposite direction to the location of the tumor.

Inflammatory and pulsating tumors can be easily eliminated in this case.

Sarcomata are the most common of the neoplasms met in the orbit. They may have their origin in the bone, periosteum, muscles, nerves, or glands. Fibromata and neuromata are occasionally found, while primary carcinomata are the rarest of orbital neoplasms and always have their origin in the lachrymal glands.

NOTE.—Since reporting the second case, I made an attempt to remove the tumor from above without sacrificing the eye. This, however, I was unable to do as all of the tissues were massed together and infiltrated. It was necessary to remove the eye together with all of the tissues of the orbit. The tumor is a carcinoma, the origin of which is probably in the lachrymal gland.

DISCUSSION.

DOCTOR GEORGE SLOCUM: There are a few features connected with these cases that are particularly interesting.

In the first case, the area about the orbit was carefully cleansed and the conjunctival culdesac freely irrigated with boric acid solution, making it as clean as possible before aspiration of the cyst. A culture was made of the fluid aspirated; after twenty-four hours there was

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scarcely any perceptible growth but after forty-eight hours a thin light growth appeared which proved to be a pure culture of a Gram positive bacillus of the diphtheria group. We were unable to find any germs in the aspirated fluid; the specimen was submitted to Doctor Warthin who found no bacteria, and it was only after forty-eight hours that there were any signs of growth in our own culture media.

In regard to the second case, a mucocele commonly presents itself in the upper, inner part of the orbit. In this case the eye is protruded outward, forward, and a little downward indicating that the pressure came largely from the direction of the ethmoid cells. This, together with the other facts that the eye was not immovable and that the growth

FIGURE II.—Orbital Tumor.

was of at least two years duration and painless led to the belief that the ethmoids were involved, that is, that we probably had a case of mucocele similar to the earlier case mentioned by Doctor Parker, which, I think justified the exploratory operation undertaken by Doctor Plummer.

With regard to its being sarcoma, most sarcomata of the orbit of such long duration as in this case, so infiltrate the tissues as to make the eye-ball almost, if not quite, immovable. The facts that the eye in this case was quite movable before the exploratory operation and that there had been no pain add to the difficulties of making a positive diagnosis.

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DOCTOR R. BISHOP CANFIELD: I remember the case very well, and I would like to remind Doctor Parker of one other case that was operated upon for carcinoma in this region. At the time this case showed no exophthalmos, but if it had gone further it would have produced it. I mention the case because I believe that we made use of an altogether new and original technic and because it gave us a satisfactory result. The case was one of carcinoma that had been operated upon several times and given up as inoperable. When it came to us the malignant growth involved the upper eyelid and structures deeper in the orbit. The man was a young and vigorous person with a long life before him and it seemed worth while to make another effort to save it. In order to do this it became necessary to sacrifice what might have been considered a useful eye if he had not had a good eye on the other side. We eviscerated the orbit and removed the periosteum entirely, removed the anterior wall of the frontal sinus and turned the skin of the lids as far as it was possible to save them into the orbit. At the same time we sewed a large skin graft to the freshened edges of the lids. The final result was an orbit thoroughly epidermized. The recovery was perfect. It was a remarkable case. He was afterwards seen working as a miner in the north country. This was two years ago, that is, four years after his operation and he was in perfect health. It was a remarkable case to us and one that we have duplicated since then. The only other report of a similar case was made at the last International Laryngological Congress at Berlin, but in this case instead of sewing in the skin graft they turned a large flap from the scalp thus securing a cure but a very unsightly cosmetic result.

DOCTOR PARKER (closing the discussion): Just one word to emphasize the cases mentioned by Doctor Canfield. I am glad that he has brought them up. The first was the most remarkable result of a malignant growth involving the orbit and sinuses that I have ever seen. The case made a perfect recovery as did the other one Doctor Canfield referred to. Such cases should be treated by a radical operation. You must keep operating until all diseased tissue is removed, if you expect the patient to receive any benefit. In our experience, results have justified radical interference in this kind of cases.

A CASE OF FACIAL KELOID DUE TO A BURN.

JAMES F. BREAKEY, M. D.
Department of Dermatology.

THE first patient presents a typical keloid involving a large part of both cheeks and part of the chin and neck (Figure I). These growths are of about one year's duration and are secondary to burns received by the patient when a celluloid eye-shade caught fire. The boy is about ten years old. He has fairly typical Hutchinson teeth and examination of his blood gives a positive Wassermann.

The fact that the Wassermann test is positive is a coincidence rather than a factor in producing the keloid and probably has no influ-

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ence on the present condition of the patient. Keloids are particularly prone to occur upon the African and are almost invariably secondary to traumatisms. The extent or character of the trauma may be very small indeed. Pin pricks are occasionally followed by keloids and the extent of the growth is more or less problematic. They usually develop for a comparatively short time and then remain stationary. In rare instances they progress for years and again rarely undergo involution. With regard to the treatment, up to the discovery of the *x*-ray there was nothing known that would satisfactorily influence them. Excision

FIGURE I.—Facial Keloid Due to a Burn.

generally results in a secondary growth larger than the one removed. Keloids are more frequently found upon the chest or sternum, but they may of course occur anywhere where there has been trauma. Excision is usually worse than useless. Various injections have been used and in some instances electrolysis gives improvement, but the *x*-ray used persistently has resulted the most satisfactorily of any form of treatment. This should be carried out continuously for from six to nine months, one, two or three times a week with comparatively short duration of exposure, being careful not to produce an *x*-ray

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dermatitis. In rare instances it is necessary to excite some reaction with the ray before getting any result. This boy has been under treatment now with the ray a little over two weeks and there is an appreciable change. Of course no form of treatment results in a complete cure. There is the patent scar remaining but the elevation may be practically eliminated.

DISCUSSION.

DOCTOR JOHN H. PETTIS: Owing to their great tendency to recurrence after removal, the surgical aspect of these growths is not very encouraging. However, in the case of small keloids resulting from a lacerated wound or any wound with a considerable loss of tissue, it is sometimes possible, by means of a plastic operation, to substitute a linear scar from the previous more extensive one; and since there seems to be some relation between the size of the scar and the resulting keloid, such a procedure often results in an improvement.

It is claimed by some that the results of *x*-ray treatment are more satisfactory in the early stages of the formation of these growths. If this is true, operation as suggested, followed by the use of the *x*-ray would seem to be the best course to pursue in selected cases. Of course in this particular case the growth is so extensive that any plastic operation is quite out of the question.

DOCTOR R. BISHOP CANFIELD: I have seen a small keloid very satisfactorily removed by excision followed by approximation of the skin edges by gauze and collodion without the introduction of sutures,

DOCTOR DEAN LOREE: A few years ago I had the surgical temerity to remove a keloid. It was situated on the upper and outer portion of the arm and measured three and one-half by four inches. The patient was a young lady about twenty-four years of age, whose vocation was that of a professional violinist, and as it interfered with the necessary movements of her bow, she was determined to have it removed although she was fully aware of its liability to return. The arm was quite fleshy and after excision there was no trouble in approximating the skin. I employed relaxation sutures of silkwormgut, and very carefully approximated the skin edges with horsehair. The stitches time this extended the whole length of the wound and of course there was a return of the keloid with some addition. Perhaps if the *x*-ray were left for twelve days, at which time there seemed a very beautiful healing by first intention, but a few days later I noticed a little extra-epithelial growth in the lower angle. In a remarkably short period of time this extended the whole length of the wound and of course there was a return of the keloid with some addition. Perhaps if the *x*-ray treatment had been employed in conjunction with the operation there might have been a better result.

DOCTOR BREAKEY (closing the discussion): Removal suggested by Doctor Pettis is a bold procedure. It is followed by recurrence usually greater than the growth removed. I should have mentioned that we tried in another case of keloid, some time ago, to freeze with carbon

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dioxid, but did not carry out the treatment sufficiently long to make satisfactory reports either way. Of course, if one attempts the surgical removal of a small keloid, coaptation should be without sutures, for practically every puncture of the skin with the needle gives recurrence quite as well as the main incision. So if one has the temerity to attempt surgical removal of such cases he should certainly warn the patient beforehand of the probability of an unsatisfactory result.

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TRANSACTIONS
OF THE
CLINICAL SOCIETY
OF THE
UNIVERSITY OF MICHIGAN

STATED MEETING, DECEMBER 6, 1911.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.
REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS.

AN ACUTE SUPPURATIVE OTITIS MEDIA, WITH ACUTE MASTOIDITIS, SINUS THROMBOSIS, THROMBOSIS OF JUGULAR BULB AND VEIN, AND EPIDURAL ABSCESS.

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INSTRUCTOR IN OTOLARYNGOLOGY IN THE UNIVERSITY OF MICHIGAN.
ANN ARBOR, MICHIGAN.

THIS patient comes to the hospital on account of pain in and behind the right ear. He has had difficulty in hearing in the right ear since he had typhoid fever three years ago, at which time he took large doses of quinine. He also has had formation of crusts and a discharge from the nose since his typhoid fever. The patient has had several operations on the right elbow and was told he had tuberculosis of this part.

His present trouble began October 21, two days before he was examined in the clinic, with increased deafness and pain in the right ear, following a ride on the rear platform of a trolley car. The pain became rapidly more intense, so that he could not sleep nor eat. He had a chill that night, followed by rise of temperature and later by a sweat. The chills, fever and sweating were repeated several times in the next thirty-six hours; also there were repeated attacks of vomiting. The patient has taken quinine, otherwise there has been no treatment. At the time of the examination he complained of severe pain behind the ear, which radiated forward and backward, and a general feeling of prostration.

On examination the nose showed both nostrils filled with foul smell-

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ing crusts. There was a large perforation of the septum. The right ear showed the tympanic membrane red and bulging; drooping of the posterior superior canal wall in the depths, with great tenderness of the mastoid over the antrum, tip and emissary vein.

Physical examination showed that the spleen was not enlarged; liver not enlarged; heart and lungs negative; no paralysis; reflexes normal. There was no Kernig's sign nor rigidity of the neck muscles. The right arm showed the results of the operation at the elbow. The blood count showed 18,500 whites and 4,750,000 reds. Urine examination; specific gravity 1024, acid reaction. Albumin positive both to heat and nitric acid and acetic-ferrocyanide tests; sediment showed many hyaline and granular casts.

The history of exposure, the pain in the ear and over the mastoid, the bulging of the tympanic membrane, drooping of the posterior superior canal wall in its depths and mastoid tenderness were sufficient to warrant a diagnosis of acute suppurative otitis media with mastoid involvement. However, the symptoms and signs pointed to something more than a simple mastoiditis. The history of repeated chills, rise in temperature, sweats and vomiting; the tenderness not only over the mastoid, antrum, and tip but also over the emissary vein and the leukocytosis pointed to the most common complication of mastoiditis—sigmoid sinus thrombosis.

A paracentesis of the tympanic membrane was done with considerable discharge of pus. The patient was put to bed and an operation advised. The prognosis in these cases without operation is grave, while with operation it is fair.

The following morning a complete mastoid, sinus and jugular vein operation, with gas and chloroform anesthesia, was done by Doctor Canfield as follows: The usual mastoid incision revealed many bleeding points on mastoid cortex. Removal of the cortex permitted pus to well out from the depths of the wound. The second incision was made at right angles to the initial incision. The mastoid was of the pneumatic cell variety, large and filled with pus and granulation tissue. There was a large epidural abcess over middle and posterior fossæ. Sinus uncovered for a large area, covered with pus. Sinus wall pearl gray in color. Sinus uncovered to the neighborhood of superior petrosal and downward into neighborhood of bulb. It was perfectly apparent that the sinus was thrombosed, therefore, resection of jugular vein was made from a point one and one-half inches below the facial nerve to a point well above the facial, from which the base of the skull could be felt in the wound. Vein removed en bloc. Large mass of infected glands removed from jugular sheath. A cigarette drain was inserted in neck. The sinus was then opened freely and hemorrhage secured from above; slight hemorrhage from below, also apparently from superior petrosal or condyloid vein. External wall of sinus removed.

The following day the patient felt well and complained of nothing except a tight bandage. The dressings were changed revealing a small

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collection of pus around the cigarette drain. The patient vomited some this day. Two days after the operation the patient's stomach was still irritable, vomiting having occurred ten or twelve times in the past twenty-four hours. The patient was very jaundiced and the stomach was washed with sodium bicarbonate solution. He was seen by Doctor Hewlett who diagnosed the condition as either delayed chloroform poisoning or a septic condition. He advised that saline be given per rectum and that acetone tests of the urine be made. From the fact that the patient had had very little chloroform, and because delayed chloroform poisoning usually comes on much later, and also since the acetone tests were negative, it was believed that sepsis could account for all the symptoms. A blood count showed leukocytes 11,800. The urine showed one-third volume albumin and there were many casts.

The third day following the operation the patient was still slightly jaundiced although the vomiting had ceased and he felt much better. The wound was dressed, and the stitches removed, revealing a slight infection of the wound in the neck. One wick of gauze was removed from the mastoid and replaced by a fresh piece. The cigarette drain was removed from the neck and an iodoform gauze wick inserted. The urine still showed albumin and casts.

On the fourth day a fluctuating, tender mass was located below the axilla on the left side which proved to be a metastatic abscess. The packing was removed from the mastoid and the cavity cleaned and repacked.

On the fifth day the mass on the side was still present, but was not so tender. The packing was removed from over the sinus and a small collection of pus found at the lower end of the sinus apparently coming from the bulb. The neck wound was laid wide open, as was also the mastoid wound. Both were packed with iodoform gauze.

On the sixth day a small collection of pus was located under the nail of the ring finger on the left hand. The jugular bulb and neck wound were irrigated with salt solution and repacked with iodoform gauze. At this time the white count was 20,000. The urine, however, was negative.

On the seventh day following the operation the patient felt much better although his temperature remained above 100°, and the leukocyte count was 19,000. Since there was a marked leukocytosis and high temperature with pus oozing up from the neighborhood of the jugular bulb into the mastoid wound, in spite of the fact that the patient felt well, attempt was made to irrigate the jugular bulb through the jugular vein from below. This was unsuccessful. Resection of the jugular bulb was advised and the following operation was performed October 31, 1911:

Resection of the jugular bulb by Doctor Canfield under gas anesthesia. The jugular bulb was freely uncovered from above so that the upper end of the jugular vein could be plainly seen. The neck wound was opened and the lower end of the jugular uncovered. This was

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followed upward to the immediate neighborhood of the base of the skull at which point a cannula was inserted and a small amount of water permitted to flow through the jugular vein into the bulb and outward into the sinus.

Following this operation the temperature dropped to normal and remained so for twenty-four hours when it again rose. A small abscess was found on the back and opened. After this the leukocyte count dropped to 7,000.

The patient began a slow recovery with slight elevations of temperature, the wounds remaining clean. The neck wound was soon closed by the use of collodion and gauze. The mastoid and jugular bulb were packed lightly with iodoform gauze and allowed to granulate.

On November 11, following an elevation of temperature, a fluctuating area was found on the right elbow. This was very tender to the touch, and apparently superficial. There was no leukocytosis. The abscess was opened and a large amount of pus evacuated. Cultures were taken of the pus but it proved to be a cold abscess since no growths developed.

The following day about two teaspoonfuls of pus were taken from the elbow. Following this there was very little discharge at this point. The pain disappeared, the mastoid cavity remained clean and the neck wound gradually healed.

The patient sat up in bed nine days after the second operation, was in a chair on the twelfth day and had clothes on and was about the wards by the eighteenth day.

For the past week the patient has run an afternoon temperature of about 100°. The mastoid cavity is clean and the neck healed although there is a slight seropurulent discharge from the elbow. There is some discharge in the ear at each dressing although, as a rule, the ear becomes dry by the third day after a mastoid operation. In this case it probably continues longer on account of the condition of the nose. This latter may also explain the discharge at the present time. He has had his nose washed out and this probably led to an infection of the Eustachian tube.

The mastoid wound will be completely healed and the patient ready to be discharged in about two weeks.

1000 Ann Street East.

DISCUSSION.

DOCTOR R. BISHOP CANFIELD: These cases are always very interesting. I think it is remarkable in this case that the patient should have had the first symptoms on Saturday morning and on Monday morning show a complete thrombosis of the sigmoid sinus and jugular vein. It speaks for the tremendous rapidity with which infection occasionally reaches the blood stream.

The clinical history is interesting also. After the first operation several metastatic abscesses developed which were all accompanied by leukocytosis except the last one. This abscess was quite the largest

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and the absence of leukocytes is explained by supposing that the abscess was due to the breaking down of an old tuberculous process without any pyogenic infection. The others were certainly pyogenic and due to the infection that caused the mastoid disease.

I think the operative procedure of irrigating through the jugular vein is worthy of mention. In such cases in the future we will try to sew the peripheral end of the vein to the skin and irrigate upward toward the base of the skull into the bulb and out through the sigmoid sinus. We are trying to secure good cosmetic results by removing the stitches early and maintaining perfect coaptation with gauze and collodion. Thus we secure obliteration of what would otherwise be a very unsightly scar.

The infection is due to infection of the lymphatic chain in the carotid sheath. These glands are always infected in suppurative processes in the jugular and the removal of the chain permits the infection to reach the other glands through the torn ends, even though the mass of glands is removed en bloc.

The sudden rise in temperature at the end of the convalescence might cause some uneasiness if he did not have an extensive tuberculous process. I think that in all of these cases in which there is a large vessel involved, we have metastatic foci we do not know anything about.

SLEEP AND THE DISORDERS OF SLEEP.

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WHY most of us spend one-third of our lives asleep is a question which is still undetermined.

The many theories of the cause of physiologic sleep can be discussed chiefly under two heads: (1) Those that attribute sleep to exhaustion of substance or energy; (2) Those that treat it as a poisoning due to the accumulation of waste products.

Whether we favor the theory of the first or second group we must bear in mind that neither exhaustion nor intoxication is a necessary antecedent to sleep. On the contrary, we usually sleep for the purpose of avoiding autointoxication and of preventing exhaustion. We sleep just before we become exhausted. Although fatigue induces sleep, too great fatigue interferes with it. R. Legendre, a French author (*Revue Scientifique,* Paris, June 17, 1911), regards sleep as defensive in its origin and believes that he has established the fact that it is intended to protect the organism from a poisonous substance acting especially on the cells of the frontal lobes of the brain. He attempts to prove this by the results obtained by depriving animals of sleep and watching their behavior. His observations are as follows: the bodily temperature remained normal, there were no variations in the respiration and the carbonic acid in the blood was not increased. Toward the tenth day

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the brain showed cellular changes localized exclusively in the frontal lobes, which seem characteristic of insomnia. Legendre succeeded in producing sleep in an animal by injecting the serum obtained from one in which he had produced insomnia experimentally. He draws the conclusion from these experiments that there is a toxin of some sort which induces sleep, and he regards sleep as an instinct of defense which protects us against the action of this toxin. He was unable to isolate or to identify this toxic substance. Be this as it may, it does not explain the periodicity of sleep, the rhythmic regulation of sleep and waking nor its psychologic phenomena. All the phenomena—periodic anemia or hyperemia, retraction of the dendrites, inhibition of the function of the nerve centers, lack of reaction to outside stimuli—regarded as causes of sleep may as well be the consequences, and even though real causes, the mechanism by which they induce sleep remains problematic. The "biologic" theory of Claparede, dealing with sleep as a distinct function, a positive active instinct with its biologic significance and like all instincts governed by the law of momentary interests, has a great advantage over all others.

The disorders of sleep may be conveniently considered under two heads: (1) Hypersomnia which may be a symptom of serious, even of fatal disease. We recognize different degrees of normal sleep according to the strength of stimulus necessary to arouse the sleeper to a consciousness of his surrounding. This also applies to hypersomnia. A mere excessive sleep may indicate the beginning of a serious pathologic state which may lead to what we call stupor and ultimately to coma. In view of the reparative function of normal sleep it might be supposed that excessive sleep would not be harmful, but as a matter of common observation it interferes with real reparation sleep and hypersomnia is accompanied by notable fatigue. Individuals suffering from simple hypersomnia are not only sleepy, but the period of their sleep is clearly increased. This symptom accompanies many forms of brain affections, or more generally speaking, affections that attack the central nervous system. Still, recent investigations lead us to believe that these states of sleep are not the effect of a neurosis but are particularly due to the maladies that affect the glands (renal, hepatic, thyroid and hypophyseal gland). Whether pathologic drowsiness is due to disease of the glandular structure, an intestinal autointoxication, an intoxication resulting from decayed teeth, a mass of adenoids interfering with respiration and causing carbon dioxid poisoning, a brain tumor especially in the region of the floor of the third ventricle or elsewhere causing increased intracranial pressure, a uremia or diabetes, or the African sleeping-sickness with the presence of trypanosomes in the blood, glands and cerebrospinal fluid, or the drowsiness produced by the combination of exhaustion with extreme cold, or accompanying disease of the circulatory system, or from other sources, the main element, though often primarily toxic, in causation is probably vascular rather than a direct action of the toxins upon the brain centers. In some cases the heart is devoid of energy, the vessels are deficient in tone, consequently in the

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erect attitude the cerebral vessels are badly filled and the patient feels drowsy, while in the recumbent position the brain becomes hyperemic causing diurnal drowsiness and nocturnal wakefulness. The approach of this kind of sleep is usually preceded by a sense of lightness in the brain. The eyelids become heavy, the eyes prick, in short, the subject feels in an exaggerated form all the sensations that announce the approach of normal sleep. If he is walking his legs seem heavy and his progress uncertain, if he sits he is soon sound asleep. This paroxysmal sleep may attack a subject while he is resting or even when actively occupied, especially in the course of mental work or during a meal. The effort to resist may at first be successful, but very often the subject is overcome by a mental clouding more or less complete.

Narcolepsy, hypnotic trance and spontaneous somnambulism are forms of pathologic drowsiness dependent upon nerve phenomena which for want of space cannot be discussed here. Suffice it to say that these phenomena can be induced by repeated monotonous visual, auditory, or other stimuli. The continuous red glow of the open fire or the soothing monotony of a sermon make this form of drowsiness a popular disorder.

Under the second head of disorders of sleep let us consider sleeplessness or insomnia. The cause of insomnia may be extrinsic or intrinsic. Accordingly this form of disordered sleep may be divided into two classes, extrinsic and intrinsic insomnia. The former is not a true disorder of sleep, being dependent upon conditions necessary to maintain the waking state in the healthy subject. Exaggerated external stimuli, such as physical pain, cough, vomiting, frequent micturition, diarrhea, pruritus and so on prevent sleep. Removal of these causes is followed by natural sleep. The sleeplessness is neither toxic nor circulatory in origin but secondary to strong cerebral impression. This group also includes emotional insomnia which is more often the result of grief than joy. It is commonly associated with the anticipation of some happiness or fear and apprehension in the immediate future. Intrinsic insomnia is either due to a toxic state or vascular disorder or both combined and may be of the high tension or of the low tension type. In both forms the brain is usually hyperemic. The patient suffering from high-tension insomnia may be the subject of general arteriosclerosis or of renal disease. Low tension insomnia, as already explained, is due to deficient tone in the vessels throughout the body and is frequently associated with diurnal drowsiness, the result of an anemic brain, when the subject is in the erect posture and a hyperemic brain when in the recumbent position. Under the head of toxic insomnia some authorities describe the sleeplessness due to excess in alcohol, tobacco, tea and coffee, also the insomnia of acute fevers which needs no further consideration being due to the common cause of insomnia. Lastly, I may mention a form of insomnia due to overfatigue and sometimes called primary or nervous insomnia. Nevertheless, the causative factors are again toxic from the toxins of exhaustion and the intestinal autointoxication which so often accompanies this disorder and vascular from the persistent cerebral hyperemia of the brain worker.

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In observing the phenomena of normal sleep and that of the disorders of sleep, whatever the cause, it is very apparent that a normal circulatory system and normal function thereof is essential to normal sleep. A deficient cutaneous circulation is almost a constant condition in disorders of sleep. A feeling of chilliness, cold hands and feet is a common complaint of the subject of disordered sleep.

It is not within the sphere of this paper to discuss the treatment of the disorders of sleep, but permit me to say that whatever the disease, if we determine the causative factor of the disordered sleep, the usual hypnotic will have but an occasional place among the therapeutic measures.

341 Liberty Street East.

DISCUSSION.

Doctor Albert M. Barrett: The disorders of sleep form a very important part of nervous diseases and especially in psychiatry they present some of the most difficult conditions we are called upon to treat. One finds that during the acute stages of many forms of mental diseases, the sleeplessness of the patient is one of the most troublesome feaures of the condition and too often one obtains no help from any of the ordinary hypnotic medicines.

We have for some time been interested at the Psychopathic Hospital in the different types of sleep which occur in different psychoses. The custom of constructing charts from nightly records of sleep covering long periods has seemed to show, at least in manic depressive insanity, that the amount of sleep the patient receives follows a periodic disturbance resembling in many ways the variations in the course of the disease. Even where the mood of the patient may be of one continued type, as depression or excitement, the sleep records may show during this one phase an undulating curve. This does not seem to be so for any other conditions we have studied, hence would seem to have some diagnostic importance.

Doctor Klingmann (closing the discussion): The patients who go without sleep for long periods, as Doctor Barrett has just mentioned, show very clearly that the toxic theory of physiologic sleep is not well founded. It would be interesting, however, to inject blood serum from such patients into animals to determine if it would produce sleep in the latter.

A CONSIDERATION OF SOME OF THE DANGERS OF OVER-INFUSION WITH SALINE SOLUTION.

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It has long since been well established as the result of much clinical experience that in saline infusion whether given subcutaneously, intravenously or per rectum we have a remedy of great value in the treatment of many pathologic conditions. It was at first received with

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much enthusiasm by practitioners of medicine because it offered a new means of supplying the blood-vessels with a fluid medium when there was considerable loss of blood and was apparently not attended by the same dangers as so commonly accompanied the transfusion of blood.

The dangers of thrombosis, embolism and hemolysis seem to be entirely overcome by saline infusion.

At first it was found to be of value in the treatment of hemorrhage and shock because these were the most common conditions for which transfusion of blood was done formerly. Later this treatment was extended in its application to acute septic conditions including appendicitis and peritonitis from any cause. It was a wonderful advance in the treatment of acute peritonitis when Murphy discovered that by the continuous instillation of normal saline solution when given slowly by the rectum large quantities of the solution could be absorbed, thus diluting the poisons in the blood and causing an active diuresis, resulting in the recovery of some of the cases which had formerly been regarded as hopeless. Thus the mortality of acute peritonitis was considerably reduced. This treatment has also been applied to cases of pneumonia and many other internal conditions. It has not often been supposed that there was likely to be any harm resulting from the infusion of large quantities of saline solution until a few German observers, notably Wideroe and Rossle, and in this country Crile of Cleveland, pointed out experimentally that one can overinfuse with saline solution and thus cause disastrous results in marked contrast to what was expected from the infusion. For the purpose of illustrating the effect of overinfusion with saline solution I performed the following experiment:

Experiment October 27, 1911—Assisted by Messrs. Tash and McCord.—Dog: weight eight and five-tenths kilos. Morphin grain one-eighth and atropin grain one-three-hundredths were given hypodermically one-half hour before the operation was started. The dog was in a stupor when anesthesia with ether was started by Mr. Tash. No difficulty with anesthesia. The common carotid artery was exposed on right side and cannula introduced and connected with the kymograph. The left external jugular vein was exposed and cannula introduced and connected with a cylinder containing isotonic salt solution, seventy-five parts to one thousand. The right femoral artery was exposed and cannula introduced for the purpose of inducing artificial hemorrhage. Artery clamped in the meantime with a small artery clamp.

3:00 P. M.—Kymograph started. Normal blood pressure equals ninety-six millimeters.

3:01 P. M.—Seventy cubic centimeters of blood removed. The blood pressure fell to eighty millimeters and gradually rose to normal.

3:12 P. M.—Forty cubic centimeters of blood removed, followed by a fall in blood pressure to seventy-eight millimeters and a gradual rise to eighty-four millimeters. In this case the compensation did not bring the blood pressure back to normal.

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3:20 P. M.—Forty cubic centimeters of blood were removed followed by a fall in blood pressure to fifty-eight millimeters and a subsequent rise to sixty-four millimeters. A grand total of one hundred eighty centimeters of blood was removed, or a little more than one-quarter of the entire blood of the body.

3:22 P. M.—Saline solution infused into the external jugular vein gradually drop by drop, as fast as it would drop without running in a stream. This was followed by a slight rise in blood pressure up to fifty-eight millimeters and then a gradual fall to fifty-four millimeters followed by a rise in blood pressure to sixty-six millimeters. The action of the heart became weaker although the blood pressure remained high until the animal died.

3:34 P. M.—Blood clots in cannula.

3:50 P. M.—One thousand cubic centimeters of saline solution infused. Blood pressure was sixty-six millimeters.

4:05 P. M.—Blood pressure fell to sixty-two millimeters.

4:11 P. M.—Acute dilatation of the heart.

4:17 P. M.—Dog dying.

4:18 P. M.—Dog dead.

Three thousand cubic centimeters of saline solution were infused altogether. A cloudy condition of the muscles in the neck was noticed during the infusion.

The abdomen gradually became distended until the pressure embarrassed the action of the heart and respiration. It was also noticed that when the saline infusion was stopped temporarily that the animal might have recovered entirely had the infusion been discontinued.

Postmortem.—Abdomen distended. Walls edematous; very little fluid in peritoneal cavity, only enough to moisten the stomach and intestines. Spleen enlarged and congested; on section a large amount of pale bloody fluid escaped. Intestines contained a small amount of fluid and their walls were edematous. Stomach contained a large amount of fluid and the walls were edematous. Liver tense and on section exudes a large amount of fluid which continues to flow for some time. Edema of pancreas and bile ducts. Heart dilated; very little pericardial fluid present. Lungs congested and on section a frothy fluid escapes. Tissues submitted to Doctor Warthin for pathologic examination. Widespread edema present all over the whole body.

The microscopic examination of the tissues removed gave the following results: Edema of the lungs; cloudy swelling and fatty degeneration of the liver; fatty degeneration of the heart and passive congestion of the spleen.

SUMMARY OF THE EXPERIMENT.

The normal blood pressure for this animal was equivalent to ninety-six millimeters of mercury. After the removal of seventy cubic centimeters of blood by an artificial hemorrhage from the femoral artery the pressure diminished to eighty millimeters and gradually rose again to

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normal. This compensation of the blood pressure after hemorrhage is effected, according to Cope, partly by a construction of the arterioles, but not entirely from the action of the vasomotor center as Crile supposed.

It has been proved that after the blood pressure has been reduced to zero and the vasomotor center is no longer active that one can get a rise of blood pressure by a reflex effect from stimulation as by burning the animal's paw.

The same results followed in three subsequent hemorrhages except in the last instance the compensation was not complete. The blood pressure rose to sixty-four millimeters only. One hundred and eighty centimeters of blood had been removed or a little more than two per cent of the body weight which is about all a dog will be able to recover from.

Then saline solution was infused into the external jugular vein gradually drop by drop which was followed at first by a slight rise of blood pressure due to the mechanical effect of a sudden increase in the amount of fluid in the blood-vessels.

This was followed by a fall in blood pressure to the point where it was before the infusion was started, due to a dilatation of the vessels to accommodate the increased amount of fluid present in them. Later on the blood pressure rose to a point considerably above where it had been as a result of the previous hemorrhage.

After one thousand cubic centimeters of saline solution had been infused the heart gave evidence of weakness as shown by the diminished height of the systole in the kymograph tracings and although the blood pressure remained high, it was not brought back to normal. Finally acute dilatation of the heart took place and the animal died.

The postmortem examination shows that the infusion of saline solution in the blood-vessels began to cause weakness of the heart action when one thousand cubic centimeters had been infused, an amount nearly equivalent to twice the weight of the animal's blood. In a case of a man weighing about one hundred and forty-three pounds or sixty-five kilograms, it would require about five or six liters of saline solution when infused rapidly to produce bad effects upon the heart. If given slowly it would require much larger quantities to produce any diminution in the force of the heart's action, provided the permeability of the vessels were the same.

There would hardly seem to be any clinical condition which would require the infusion of such large quantities of saline solution. The infusion of an amount of saline solution equivalent to three times the weight of the blood has been done without any harmful effects. According to our experiment, an infusion of saline solution equivalent to a little over one-half the body weight and a little more than twice the weight of the blood was sufficient to cause death. Saline solution should never be infused faster than one liter in about twenty-eight minutes. The experiment also shows that one should watch the action of

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the heart as well as the blood pressure when performing a saline infusion.

Rossle, in 1907, stated that from his experience he did not consider saline infusion as indicated for heart weakness because he found certain changes in the heart after its use. He claims that the heart looks cloudy after saline infusion but that the microscope fails to reveal any evidence of parenchymatous inflammation. This he saw after saline infusion in cases of apoplexy, ileus without peritonitis or primary heart weakness and shock. Generally the heart is dilated and looks moist and friable. In cases of considerable infusion the blood is very thin, the clots watery and of a transparent yellow color and the contents of the intestines are usually fluid. He describes a case in which a hitherto healthy primipara had heart failure during the expulsive period, and salt solution was injected. The child was artificially delivered and profuse diarrhea followed, the patient dying in collapse about one hour and one-half after the second infusion. Autopsy revealed changes indicating intoxication with the salt solution, similar to those observed in animals after excessive saline infusion. The bladder was found empty, showing that the kidneys had been unable to secrete urine notwithstanding the infusion of two liters of salt solution within two hours. In another case a woman of fifty-four, with cirrhosis of the liver, being operated upon for a large ovarian cyst, was given copious saline infusion and the next day ascites developed for the first time; two and one-half liters of ascitic fluid were found in the abdominal cavity at autopsy and the kidneys showed fresh parenchymatous inflammation.

Crile has also shown experimentally that after a long delay after hemorrhage the infusion of saline solution at a moderate rate raises and maintains the blood pressure for only a short time. Therefore it is only a temporary stimulant to a heart weakened by loss of blood or other causes and when carefully used by increasing the blood pressure it will give the heart sufficient strength to tide it over a dangerous period and thus save the life of the patient. He also has shown that after infusing an amount of saline solution equal to the amount of blood withdrawn during hemorrhage a farther infusion was associated with lowering of the blood pressure even if the heart was not overtaxed. This shows that the amount of infusion should be just sufficient to compensate for the loss of blood during hemorrhage, because an infusion of saline solution in amount in excess of the amount of blood lost during hemorrhage is likely to embarrass the respiration.

Crile also showed that after a long wait after hemorrhage, but with compensation well sustained, saline solution raised the blood pressure still farther. He also showed that saline solution is much more effective in restoring the blood pressure when given slowly than when given rapidly.

Wideroe, in 1910, experimented with three rabbits, infusing them with very large quantities of saline solution. The first animal died of an acute infectious disease. The second animal was infused with saline

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solution equal to seven and six-tenths per cent of body weight daily for thirty-two days when it died. Section showed a dilatation of the right heart and endocardial bleeding. The lungs and kidneys were hyperemic and contained small hemorrhages. The epithelia of the convoluted tubules showed degeneration.

The third rabbit was infused for fifty days with seven and nine-tenths per cent body weight of saline solution daily or two hundred eighty-eight grams. In all it was eleven and one-half liters, about three times its body weight. Then it died. There were no hemorrhages in the endocardium, but the other changes were the same as in the second animal. He considered that four and nine-tenths to five and one-tenth liters of saline solution are sufficient to cause death in man, taking the average weight as sixty-five kilograms. According to the same calculation deduced from the results of my experiment about five liters of saline solution when infused rapidly would be sufficient to cause death in man. Large infusions can therefore cause degenerative changes in the heart muscles. These experiments are only of value in showing the amount of saline infusion which is likely to cause death if given at one time. They have no other application clinically because there are no conditions that require the use of such large quantities of saline solution in man.

Sippel believes that subcutaneous saline infusion should not be used in patients with eclampsia who have kidney disease. On the contrary Max Henkel, after a number of experiments with saline infusion upon pregnant women and upon patients with nephritis, came to the conclusion that no harmful effects can come from the use of saline solution upon a human being when used in the quantities that are ordinarily employed. This is true even if the kidneys are diseased. It can be used in large quantities whether edema be present, heart failure, nephritis, or elcampsia.

Bittorf and Jochmann found that the diuresis produced by saline infusion lasts only a few days and that it has no harmful effect upon the kidneys. They experimented upon men both with acute and chronic nephritis, both parenchymatous and interstitial. Their conclusions are opposed to the view that retention of chlorides is the cause of the edema or that further damage to the kidneys can result from the use of saline infusion.

James S. Waterman, in the *New York State Journal of Medicine* for May, 1911, while discussing venesection and saline infusion in pneumonia states that in one case he injected one thousand cubic centimeters of saline solution into the median basilic vein after removing about three hundred and fifty-five cubic centimeters of blood and the patient recovered. In this case not an unusually large quantity was injected or not quite three times the amount of blood which was removed. There is no question but that a venesection followed by infuson of saline solution equivalent in amount to the amount of blood removed is a procedure which may prove to be of marked benefit in that stage of pneumonia when the right heart is engorged and the patient is overloaded with

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toxins. On the contrary one must be careful not to overtax the heart with too large a saline infusion or to further increase the edema in the lung by a transudation of the saline soluton from the blood-vessels. The danger of fatty degeneration of the heart and liver as shown experimentally from overinfusion with saline solution should not be forgotten. In proper quantities and when given slowly it increases the force of the heart's action by floating the blood corpuscles, and by increasing the amount of fluid in the vessels it raises the blood pressure and thus causes an active diuresis resulting in a rapid elimination of the toxins.

Saline infusion when used in moderate quantites should never produce harmful effects in the human being. When used in very large quantities they may prove harmful as shown by the researches of Rossle, Sippel, Crile, and Wideroe and the experimental evidence which I have submitted.

Such a radical opinion as that of Max Henkels that no possible harm can result from the infusion of large quantities of saline solution in the human being cannot be accepted without criticism because the effects differ in different individuals and under different conditions in the same individual, depending upon the weight of the individual, the amount of blood in the blood-vessels and the condition of the heart.

Saline infusions should be used with great care and the amount to be infused is to be determined by the effect upon the blood pressure and the heart. In some cases one or two pints of saline when infused into a vein is sufficient to raise the blood pressure and more than this may produce harmful effects; when larger quantities than four to five pints are required to restore the blood pressure the prognosis is not favorable. The infusion should be given slowly to avoid the danger of dilating the heart and causing edema of the internal organs. It should not be given faster than one liter in twenty minutes, or one-half an hour. It is contraindicated when there is distension of the right heart and venous stasis without a previous venesection. In such a case an equivalent amount of saline solution should be infused as compared with the amount of blood removed.

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DISCUSSION.

DOCTOR REUBEN PETERSON: Doctor Georg has brought up for discussion a very important subject and it is a pity that the hour is so late. Practically I find that it is very difficult to determine at a given operation just how much blood has been lost. Pallor and increased pulse rate, while aids, are apt to be brought about by other operative causes. There is no question but what the intravenous injection of salt solution acts more quickly, yet it must not be lost sight of that it is not devoid of danger. One may inject too much and there is always the danger of the introduction of air. Clinically, if the patient is so far reduced from loss of blood or shock or both that the saline cannot be absorbed subcutaneously, I have found that matters are not helped much by the substitution of the intravenous method. In other words, when this point has been reached, the effect of the loss of blood and the shock of the operation upon the heart and the great nerve centers has been so severe that saline no matter how introduced has very little effect.

We must not lose sight of the fact that one great error in technic of giving salt solution is that it is not given hot enough. Through a faulty apparatus it is far below 110° when it enters the circulation and may even add to rather than diminish shock.

I have no doubt in many instances, results such as Doctor Georg reports from his experiments occur in the human from giving too much salt solution.

REPORTS OF CASES.

HOOK-WORM DISEASE AND MULTIPLE LIPOMATA.

HARRY B. SCHMIDT, M. D.
Department of Medicine.

R. B., male, aged fifty, a South American planter, entered the University Hospital November 13, 1911, complaining of multiple swellings beneath the skin which he thought were due to filarial disease. His family history was negative. He had had several attacks of malaria, the last, two years ago. The first subcutaneous tumor appeared six years ago beneath the scapula on the left side. Since then numerous tumors have appeared on various parts of the body which have varied somewhat in size, apparently becoming larger when he was not feeling well. On examination these tumors, which were numerous, appeared to be situated in the subcutanous tissues, being freely movable in regard to both the skin and the deeper tissues. They were soft, irregular in shape, not tender, and bore no relation to the nerves or lymphatic glands. Pathologic examination of one that was removed showed a lipoma.

The blood was negative for filaria but the differential count of the leukocytes showed thirteen per cent of eosinophiles. A careful examination of the stools showed fairly numerous motile embryos of the uncinaria americana and after centrifugalization a small number of typ-

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ical eggs. Eggs of tricocephalus dispar were also found. Adult uncinaria were recovered after treatment with thymol.

It is interesting that the motile embryos in the stool were more numerous than the eggs in the first specimen examined although the stool was fresh. The condition apparently produced no symptoms and would not have been suspected except for the residence of the patient and the eosinophilia.

DISCUSSION.

DOCTOR MARK MARSHALL: This case is particularly interesting because we see so few of them at this hospital. Of course we will not know whether this patient is cured until we have examined the stools further for the eggs of the hook-worm. The average case requires four or five courses of thymol; in many cases eight or ten treatments are required to bring about a permanent cure. I think the disease is most interesting because of its being so widespread in certain localities and because of its influence upon the mental, physical, sociologic state of the people affected. In Porto Rico there are seven hundred thousand peasants and most of them are infected with hook-worms. The average hemoglobin of these people is only forty per cent. This is shown in the inefficiency of the laborers. The work of treating all of these cases was undertaken by the Medical Department of the United States Army under the leadership of Doctor Ashford who was placed at the head of the first anemia commission of Porto Rico, and when one considers the very small amount of money at their disposal the work accomplished is really remarkable. During the fiscal year of 1907-08 they had at their disposal fifty thousand dollars to be used in the treatment of hookworm disease. They established thirty-five treatment stations throughout the island, some equipped for taking bed patients. Most of them, however, were run simply as dispensaries. The personnel of one of these hospital stations was one physician on a salary of one thousand dollars per year, an assistant and nurse and one servant, the total expenditure for salaries for the year being fifteen hundred fifty dollars. The dispensaries had one physician at seven hundred dollars a year, one assistant and one nurse, a total of a little more than one thousand dollars a year.

During the year 1907-08 they treated ninety thousand cases according to the method outlined in Doctor Schmidt's paper which means that ninety thousand stool examinations had to be made in order to make definite diagnoses. The stools were examined once a week thereafter, which made in all a total of five hundred thousand microscopic examinations carried out at these thirty-five stations. This work was done at a cost of fifty-four cents per case, which is remarkably low and speaks well for the organization engaged in the work.

DOCTOR ALBION WALTER HEWLETT: That these two patients are here is due to the fact that we have attracted students from South America. In regard to the patient with the hook-worm disease, he was

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very nervous. He had tumors all over the body and was told that they were due to filaria. I brought him into the hospital chiefly in order to remove from his mind the feeling that he had some serious disease standing over him. We were able to get him in a better frame of mind partly by showing him that these tumors were nothing but fat, and that he had some hook-worms which were removed. Possibly the latter were responsible for his general nervous condition, but aside from that they produced no symptoms.

REPORT OF A CASE OF AMEBIC DYSENTERY.

LUTHER F. WARREN, M. D.
Department of Medicine.

The patient entered the University Hospital on Friday, November 17 complaining that he was gradually growing weak and had distress and uncomfortable feeling in the stomach region, made worse by eating. He had a mild diarrhea, having when he entered five or six movements per day. He was twenty-eight years of age, a merchant, and was from South America. His family history was negative.

He had malaria at nine, and again at nineteen. At the age of sixteen he had gonorrhea. Five years ago he had swollen inguinal glands which suppurated and remained so for five months. He denies specific disease. Further than this his personal history is negative.

His present trouble dates from ten years ago. In the Columbian revolution he was cast on an island and was starved. He remained here for four months and became so hungry that he would eat the palm leaves. These, he said, would irritate the stomach; then he would vomit them, and then eat the vomitus. The patient says he has never been well since, being troubled, as I have said, with these symptoms on the part of the stomach. These have gradually progressed up to three years ago when he had a severe attack of diarrhea and noticed at this time a large amount of mucus in the stools. He did not go to bed, but took ipecac and placed himself on a diet. In a short time he got relief. He remained well for about a year. Then two years ago he had another attack of bowel trouble and noticed blood in addition to the mucus. He again repeated his own remedy and when he came to us he was having a third attack of a similar nature, his treatment not being as satisfactory as previously. He would pass as many as ten stools per day. They were watery in character. It has been said that in the case of a patient with amebic dysentery one thing is easy and that is getting the stools; whenever we wanted a warm stool for examination and would ask him to save one he would say: "You can have one right now if you want it."

His symptoms fall in very well with those described by those who have seen many of these cases, and particularly by Strong, who places gastrointestinal symptoms first, including nausea and vomiting. During the attacks of diarrhea bloody mucus appears in the stools. Patients

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do not have very marked pain, particularly in the form this patient presents. There are severe pains in the acute forms.

The urine was negative. The stomach showed subacidity, on a full meal at four hours, free 8, total 24; on a shredded wheat biscuit at fifty-five minutes nothing was obtained; on one at forty-five minutes, 80 cubic centimeters, free 12, total 20. His blood showed evidences of concentration—6,000,000 reds on entering, 18,000 whites and ninety-nine per cent hemoglobin. A differential count showed 22 lymphocytes, 2 transitionals and 22 eosinophiles, fifty-four per cent polynuclears. As eosinophilia is not a finding of amebic dysentery, careful microscopic examination showed the presence of eggs of both the uncinariasis and trichocephalus dispar; these were the causes of this finding and in severe infections might cause symptoms of which this patient complained. Examination of the mucus of the stools, however, showed the ameba. On account of the rapid motion and intrusions of red blood cells it belonged to the pathogenic group. Inoculation into the bowels of the dog or cat was not done. This is done to determine the pathogenicity. After thus making the diagnosis the man was placed on treatment. Of the two methods most usually employed, quinine injections and the ipecac treatment, the latter was employed. After cleaning this man out thoroughly with calomel and salts we gave him sixty grains of powdered ipecac coated with salol and gave a liquid diet. This was repeated daily and on the third day he had eight stools, became nauseated, and vomited, for which we gave morphin, and again gave him forty grains of ipecac per day. Two days later he became restless, morphin was given again and the ipecac still continued. This was dropped to ten grains per day during the past week. For the past week the examination of stools has failed to show any occult blood, although up to that time this was present. Yesterday he had but one stool, and today up to this evening has not had any stool. The stool passed now is free of mucus. Proctoscopic examination shows mucus membrane intact, no ulcers, no bleeding points. Neither eggs nor amebæ can be found. Patient was discharged with advice as to treatment and diet.

DISCUSSION.

Doctor James G. Van Zwaluwenburg: The principal interest in this case is its novelty in this neighborhood. We should not lose sight of the fact that these cases occasionally occur here. About four years ago a person came to the University Hospital from Detroit, the patient never having been outside of Michigan. He complained of considerable looseness of the bowels and of tenesmus before that. Examination of the stools demonstrated the presence of trichomonas and circomonas and there was constantly blood in the stools. On the basis of this a diagnosis was made of ulcer of the rectum and the case was reported as one in which undoubtedly the trichomonas were the cause of the ulceration. The patient returned two years later with practically the same symptoms in spite of continued thymol treatment and other intestinal anti-

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septics. He came in during the exacerbation of his trouble. The very first examination showed active amebæ in the stools. He was kept under observation for several days and every stool thereafter showed more or less active amebæ. The man was treated and although he never entirely lost the amebæ, he became very comfortable and since that time has been at work in this town and has had no further trouble.

The organisms undoubtedly live in Michigan. The source of infection, as near as we could trace it, was from a contractor's well in the River Rouge district. The man had practically never been outside of Wayne and Washtenaw counties and since the infection is not common in Detroit, we are loathe to lay the blame on the Detroit water supply; also there were one or two other cases in the immediate neighborhood, traceable to the same well. This is very exceptional, and still it shows the possibility of the disease being in Michigan.

In most cases the diagnosis is comparatively easy. It is not a difficult feat to find the amebæ if one properly undertakes it. Probably the best and easiest way is to pass a rectal tube a few inches into the bowel, then withdraw it and examine the mucus that adheres to it; this almost invariably shows amebæ if they are present. It is almost impossible to recognize them in a cold stool because of their resemblance to other bodies occurring normally or accidentally in the stool. The diagnosis must rest on the finding of actively motile amebæ which is practically impossible in the winter without a warm stage; in the summer time it is comparatively easy. The most striking characteristic of entameba histolytica is its very active movements. Of course it is not the only ameba in the bowel, but it is comparatively easily recognized from the fact that its movements are so brisk and so active.

Doctor Albion Walter Hewlett: It is interesting to note that in the Canal Zone they are enthusiastic over the value of ipecac in the treatment of chronic amebic dysentery while in Manila they are pessimistic about curing it.

CARDIOSPHYGMOGRAPHY BY LIGHT PROJECTION METHODS.

JAMES G. VAN ZWALUWENBURG, M. D.
Department of Medicine.

The errors in the curves obtained by graphic registration of various cardiovascular pressure changes, introduced by the momentum of the moving parts of the instrument, have been a serious obstacle to the study of these phenomena. Recently Otto Francke has substituted a pencil of light for the usual lever arm on the ordinary tambour, thereby reducing this momentum to a minimum. Whereas the ordinary sphygmograph has an automatic vibration time of from eight to twelve per second, Francke's instrument easily runs over one hundred and by that means a more accurate representation of the actual pressure changes is obtained.

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In common with many other observers, we have frequently found the jugular curve obtained by the Jacquet sphygmogram relatively complicated and the Francke's instrument has been used to study these more complicated forms.

The phlebomograms so obtained roughly fall into two classes. The first show the classical *a*, *c* and *v* waves. It is the tracing which is invariably obtained over the external jugular and occasionally over the jugular bulb. In the latter position, however, the typical tracing shows several extra waves. The main features may be roughly grouped as the wave of auricular contraction, the waves at the beginning of and those at the end of ventricular systole.

The interpretation of these ventricular systolic waves is exceedingly difficult because of their short duration and the absence of any fixed points in the cardiac cycle with which they can be compared. It is not impossible that one or more of these are of arterial origin, since the anatomic relations of the jugular bulb make it almost impossible to exclude all arterial movement.

An auricular cannula was accordingly passed into the right auricle of the dog, producing the tracing here reproduced. Simultaneously tracings were taken from the carotid and the heart sounds were recorded by means of a phonoendoscope.* It will be seen that two waves constantly occur at the beginning and two at the end of ventricular systole. A tracing from the arch of the aorta by means of a bag within the ascending vena cava and in contact with the arch, allowed us to determine the transmission time from the root of the aorta to the carotid. By proper time corrections it now appeared that these four waves represented the opening and closing of the two valves of the right heart. Esophageal tracings from the neighborhood of the left ventricle gave corresponding results for the left side of the heart. In many cases the waves in the two auricles do not accurately coincide, that is, the valve plays on the two sides of the heart are not absolutely synchronous. This applies to the waves in early systole, as well as those in late systole, although the latter might be expected from the common clinical observation by the reduplication of the second sound. The difference in time in the majority of cases was less than four-hundredths of a second.

Without an accurate knowledge of the delay in transmission of the venous wave from the right auricle to the neck, it is impossible to recognize the jugular equivalent of the auricular wavelets.

A study of the human cardiogram was undertaken in the hope that it might throw some light upon the problem. Here again the tracing is far more complicated than in the classical descriptions of tracings taken by other means. In its typical form the auricular contraction appears not to be represented since the movement begins considerably after the beginning of the auricular wave on the jugular. It is then marked by a high, sharp wave, whose apex coincides with the beginning of the first sound. The descending limb is introduced by a sharp rise followed by a wavy plateau, which lasts throughout the output period

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the tracing is interrupted by a slight notch, occurring about the time of the second sound, then falls considerably below the abscissa and is terminated by a rather sharp elevation occurring some time after the beginning of diastole. The exact form differs considerably in individuals, and in the same individual in different situations. The systolic plateau appears only at the point of maximum impulse and is replaced by a retraction elsewhere over the precordium. The remainder of the tracing is usually as described. Under pathologic conditions there may be extensive modifications in the relative size and the time relations of these various components.

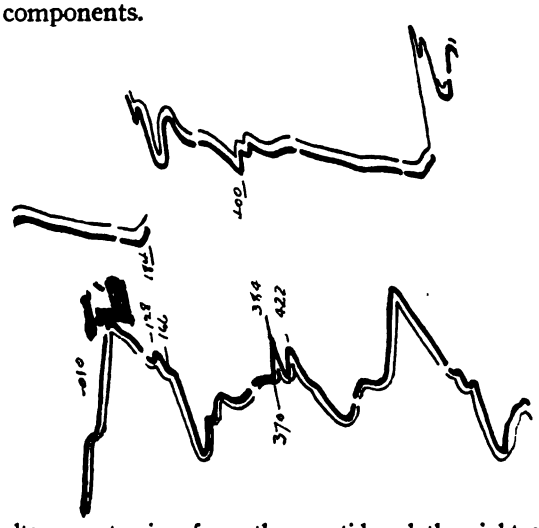

FIGURE I.—Simultaneous tracing from the carotid and the right auricle of the dog. Note the groups of two small wavelets at the beginning and at the ending of ventricular systole.

The analysis of the cardiogram becomes very difficult because of the absence of fixed points in the cardiac cycle and the possibility of asynchronism between the two sides. An interesting feature is the prominence of the wave in early diastole last described in cases of gallop rhythm. From many tracings it is perfectly clear that this wave does not represent auricular systole but is a diastolic phenomenon and in several cases where the third sound has been recorded, these two phenomena are synchronous. We are inclined to interpret its crest as marking the beginning of the period of "diastasis."

Superficially there is frequently a very striking similarity between the cardiogram and the jugular phlebogram both in the size and the chronologic sequence of their waves, suggesting very strongly the hypothesis that the jugular tracing represents simply a cardiogram taken from the base of the heart, with the addition of the wave of auricular systole.

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DISCUSSION.

DOCTOR J. HOWARD AGNEW: This has been a very interesting demonstration of what improved methods will accomplish. The curves are markedly different from those obtained by the ordinary method with the writing needle and smoked paper. It shows the advantages of improved technic over the older methods, for in these light projection curves we have a great many more waves than are obtained by the ordinary instrument which cannot be due to the latter as their oscillation time differs so greatly from the vibration time of the instrument.

The problem is of course to interpret and correlate these many waves, which Doctor Van Zwaluwenburg has done by pointing out that they are probably due to opening and closure of the valves. The experimental work is interesting as showing the asynchronism of the right and left heart and that therefore tracings from two sides by means of the esophageal tube and the jugular pulsations are not exactly comparable in their time relations.

DOCTOR ALBION WALTER HEWLETT: I have followed this work with much interest. These finger methods which show a larger number of waves make the tracings more difficult to interpret. The tracings from the auricle are relatively easy to interpret for the question of transmission time to the neck is eliminated. I think these tracings show quite definitely that the opening and closure of the aortic valves are recorded in the auricles.

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TRANSACTIONS
OF THE
CLINICAL SOCIETY
OF THE
UNIVERSITY OF MICHIGAN

STATED MEETING, JANUARY 10, 1912.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.
REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS.

A CASE OF DURAL TRANSPLANTATION.

R. BISHOP CANFIELD, A. B., M. D.
PROFESSOR OF OTOLARYNGOLOGY IN THE UNIVERSITY OF MICHIGAN.
ANN ARBOR, MICHIGAN.

I DESIRE to put on record the following case because, as far as I know, it is the only case in which dural transplantation has been attempted. The history of the patient is as follows:

Mrs. Sarah V., aged forty-three, a resident of Ann Arbor, presented herself in the clinic of Otolarnygology, University of Michigan Hospital, with a history of having had a discharging ear since childhood. She has occasionally had severe pain over the left mastoid and left side of head and has had occasional attacks of dizziness, during which she has not fallen, but has felt great discomfort. Examination of the left ear showed the deeper parts of the canal filled with foul smelling crusts and pus with some thickening of the anterior inferior canal wall and great destruction of the tympanic membrane. Shrapnell's membrane, posterior to the short process, was lacking; stapes and incus plainly seen through perforation. After considerable nonoperative treatment without improvement in her condition, a radical mastoid operation was advised. This was performed April 27, 1909. A tedious but satisfactory convalescence was established and the patient made a satisfactory recovery.

October 28, 1909: Since the radical mastoid operation there

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have been times when the ear would discharge somewhat. During the periods of discharge she felt perfectly well, but between attacks complained of some dizziness and pressure in the head. Examination of the ear at this time showed it to be completely epidermatized.

January 31, 1910: For several weeks the patient felt perfectly well and gained in weight; ear has remained dry. Recently she has had some dizziness and pain in the head and sense of discomfort in the left eye. There is a slight horizontal nystagmus of one degree to both right and left. From this time on the patient was treated occasionally in this and the Neural clinic.

October 14, 1911: Nystagmus of one degree to both right and left. Turning to the right showed after nystagmus of twenty-two seconds; turning to the left showed after nystagmus of forty-five seconds with marked dizziness. Irrigation of the left ear with cold water showed slight horizontal and rotatory nystagmus when eyes were turned to the opposite side, lasting a very few seconds without dizziness. Irrigation of the right ear with cold water showed horizontal and rotatory nystagmus to the left lasting one minute and fifty seconds with marked dizziness.

October 17, 1911: Turning to the right gives an after nystagmus of twenty seconds with marked vertigo. Turning to the left, no after nystagmus and very slight vertigo. Irrigation of the left ear with cold water gives a slight horizontal and rotatory nystagmus to the opposite side. Patient stone deaf. Leukocytosis 10,500.

November 1, 1911: The following operation was performed under ether. Old mastoid wound opened up, found perfectly epidermatized. Wound cavity discovered as at previous operation. As the operation progressed there was discovered a sac capable of holding probably one-half drachm of material with an opening into the tympanic end of the Eustachian tube, passing backward through a small sinus along the roof of the middle ear and mastoid to a point corresponding to the roof of the antrum, at which point it opened out into a balloon-shaped cavity over the roof of the mastoid and back of it. Pressure on this evacuated fluid through the tympanic end of the Eustachian tube. This sac was curetted away. The cerebellum was uncovered and an attempt made to open labyrinth from behind. On account of the escape of cerebrospinal fluid from a small circular opening in the dura, which was probably a large perilymphatic duct, this stage of the operation was not permitted. The labyrinth, however, was opened widely from in front. As a result of the packing necessary to control the flow of the cerebrospinal fluid, the opening in the dura was much enlarged. One stitch was then taken in the dura. The patient made a good recovery from the anesthetic.

November 3, 1911: Following the operation the patient's sub-

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jective symptoms improved remarkably and she said she felt better than for a long time. She developed a slight nystagmus to the opposite side which persisted for three or four days. On the second day following the operation the amount of cerebrospinal fluid lost, increased markedly so that the bandages, pillow and upper part of the bed were soaked. The patient developed a temperature, stiff neck, Kernig's, Babinski and some opisthotonos. She became somewhat stuporous. However, a leukocytosis did not develop. It was apparent that the patient was rapidly growing worse and without some further operative intervention would probably die shortly. On this account the following operation was done at midnight: The dura of a dog was secured and tamponed firmly against the cerebellum in such a way as to cover the exposed cerebellar tissue and completely close the opening which at this time was about the size of the middle finger. Following this procedure the patient was put in bed with the head of the bed elevated. Following this operation the cerebrospinal fluid ceased to escape, and there was a marked improvement in the patient's subjective condition with decrease in pain and decrease of temperature.

November 7, 1911: Despite occasional attacks of severe occipital and right-sided headache and the fact that her temperature ranges from 101° to 104.6°, the patient's subjective condition continues to improve. Today patient had a slight nose-bleed. The wound was dressed and found perfectly clean, the dural graft was in position and there was no escape of cerebrospinal fluid. A Widal test was ordered.

November 9, 1911: For each succeeding day the highest temperature is lower than the day before, the highest for today being 102.6°. Last night the patient complained of pain in the epigastrium and fainted. An ice-cap was placed over the heart and a turpentine stupe over the abdomen. The patient slept very little. She feels fairly well today. The wound was dressed and found perfectly clean. Although there was some discharge on the dressings, there was no evidence of the escape of cerebrospinal fluid and the dural graft was in position. The white blood count was 6,500.

Then followed an uneventful convalescence.

300 State Street South.

DISCUSSION.

DOCTOR FERRIS N. SMITH: I have no comment to make upon the details of the nystagmus examination as outlined. I do wish to make a brief comment upon the importance of the work on nystagmus. Previous to this time, it was possible to discover the cochlear involvement in the labyrinth and by means of the four signs and symptoms named, it was possible to discover that there was some vestibular irritation, but it was impossible to make a diagnosis of the

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extent of this irritation or to differentiate it from irritation which might be meningeal or cerebral. This work, which has been brought to its present state by Barany and Neuman, has made possible a much more definite diagnosis and the determination within certain limits of the necessity for operation. In this case just reported by Doctor Canfield the radical operation was performed. It is possible that even at that time there was some suppuration in the labyrinth.

A few words might be said about the frequency of labyrinthine suppuration. Statistics show that there is a very considerable range in the percentage of cases. It was estimated by several reporters that there was one case of labyrinthine suppuration in every one hundred cases of middle ear suppuration, but this figure ranges from one in one hundred to one in five hundred. Avenues of infection other than the middle ear are to be considered: primary infection of the blood stream itself; also extension into the internal auditory canal from the meninges; and still another source, which is very rare, extension from suppurative thrombosis in the lateral sinus through the collateral circulation.

Just one other comment upon this particular case in regard to the postoperative treatment. Much cerebrospinal fluid had been lost and this raised a very serious question. At first Doctor Canfield had no definite idea of how to meet this emergency and several expedients were tried. The first effort was an attempt to use the skin of hard boiled eggs. They frequently have a thick skin which would answer for this purpose, yet all of those at hand were found to be too thin. The dura from a guinea-pig also lacked the required strength and finally he tried the dog's dura.

It seems to me that every clinic where much head surgery is done might well keep in stock a piece of dura of the tensile strength of the dog's and preserve it like catgut, for just such emergencies, not only postoperative emergencies, but those arising from fracture in which there is a tear in the dura which does not admit of suture.

Doctor Claude T. Uren: This patient presented herself in the clinic several times after the mastoid operation, each time complaining of pressure symptoms in the back of the head, but did not complain of dizziness or vestibular symptoms until the past year. The dural end of the Eustachian tube never closed completely. A false membrane would form over it at intervals and it was at this time that she complained of the feeling of pain and pressure. The removal of the false membrane permitted the discharge of a small amount of mucopus following which she would feel much relieved. The mucopus probably came from the sinus that Doctor Canfield mentioned. Her after-treatment since the last operation has been uneventful and at the present time her mastoid cavity and tympanum are practically epidermatized.

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A CASE OF POSTOPERATIVE HEMIPLEGIA WITH CEREBRAL HERNIA.

THEOPHIL KLINGMANN, M. D.
DEMONSTRATOR OF NEUROLOGY IN THE UNIVERSITY OF MICHIGAN.
ANN ARBOR, MICHIGAN.

H. VON A., aged twenty-four, domestic, American. The patient was admitted to the surgical clinic and transferred to the Neurologic clinic of the University Hospital, December 22, 1911.

Family History.—The patient's father died two years ago of lung trouble. Her mother is living and well. There are three sisters living and well.

Previous Medical History.—The patient was well until she had appendicitis in 1903. She was not operated on at this time but had an operation for appendicitis two years later. She had stomach trouble after this operation. In July, 1909, she had a severe fall from a high ladder, and it is stated that she was blind very shortly afterwards. This blindness was temporary, but later in the summer of this year there was a gradual loss of vision. From the time of the injury she had a great deal of headache beginning in the occipital region and radiating forward to the forehead. There was no dizziness, no disturbance of the gait, and no nausea nor vomiting. In July, 1910, the headache became violent. She had her eyes examined but was only temporarily relieved by wearing glasses. Her physician advised her to go to Chicago for treatment. She was operated on November 28, 1910. The patient was told that she had a brain tumor, or pressure on the brain, for which the operation was performed, but apparently no tumor was found, and it was stated that a second operation would be necessary. It was thought that there was a tumor in the occipital region. The second operation was not undertaken and no details can be obtained regarding the first operation, but undoubtedly a portion of the dura was sacrificed, permitting of the large cerebral hernia, which has been opened repeatedly. There is an escape of clear fluid when the hernia is opened, after which the patient sleeps a great deal. We are told that light perception returned after the operation. The hemiplegia came on immediately after the operation.

Examination.—The patient is of medium height; she appears well nourished, the skin and mucous membrane having a good color. The skin is free from pigmentation and eruptions. Just below the right shoulder there is a deeply pigmented birth-mark, to the right of the umbilicus there is a linear scar about two inches long, the result of the appendicitis operation mentioned in the foregoing history. The abdominal muscles are rather rigid. The tongue is heavily coated and the breath rather foul. The thyroid gland is not enlarged and there are no enlarged lymphatic glands. The patient lies quietly in bed. She asks repeatedly when her eyes can

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be examined, or if she will ever see again; other than this she has no requests and no complaints. She responds to some simple commands but appears to have considerable difficulty in hearing. She replies to some questions and states that she has no headache now but did have headache last summer, and that her blindness came on last summer before the operation, also that light perception returned after the operation. There is a large protrusion in the right temporal region which appears larger than it did two weeks ago. It displaces the ear to some extent. It is soft, fluctuating, not pulsating. The edges of the opening in the skull cannot be felt. The protrusion is apparently not painful on moderate pressure. The patient is blind. The ophthalmoscopic examination made by Doctor Parker gave the following result: The disc of the right eye is pearly white, vertically oval; lamina cribrosa hidden; margins slightly blurred. The cup is filled with a grayish brown tissue. There is some perivascular infiltration. The arteries are contracted. In the left eye are several white spots, irregular in outline, situated toward the macular region, indicating an old infiltration or slight hemorrhage. The arteries are contracted and the disc is more blurred than that of the right eye; it is vertically oval and there is a white spot indicating an old hemorrhage situated just above the disc. Perivasculitis is more marked than in the right eye. Diagnosis: Postneuritic optic atrophy.

The extraocular movements in any direction are limited. The eyes are usually turned toward the right. There are nystagmoid movements on looking to either side, particularly the right. On the left side of the face the natural lines and folds are absent. There is a motor weakness in the left corner of the mouth. The left angle of the mouth remains passive when patient attempts to show upper teeth. The mouth is drawn to the right. The tongue when protruded deviates toward the left. There is no rigidity of the neck muscles or back. The head can be moved freely without pain. The left hand and arm are contractured in flexion. The contracture can be overcome by passive extension. The patient can move the left arm slightly but not the hand. There is a slight atrophy in the hands. Light touch and pin-point is not felt as plainly over the left arm and leg as over the extremities of the right side, although there is no anesthesia anywhere. The left biceps and triceps jerks are increased, the right are normal. In the left leg there is but little voluntary motion. The left knee jerk is increased. The left Achilles jerk is also very prompt. No ankle clonus can be obtained owing to the marked contracture of the left foot in plantar flexion. The Babinski reflex is present on the left side. In the right lower extremity all normal movements are retained and muscular strength is fairly good. The right knee jerk is prompt, also the right Achilles jerk. Plantar irritation causes plantar flexion.

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The urine and feces are voided involuntarily at times, apparently due to the patient's mental condition.

A lumbar puncture was made with the following results: There was no increase in pressure and the spinal fluid came drop by drop through the needle, and was clear and colorless. The chemic and microscopic examinations were negative. The cerebra' hernia was also punctured. From this came a yellowish brown fluid with considerable force. After centrifuging the fluid it was still of a golden-yellow color. The microscopic examination showed a marked increase in the cellular elements and there were some red blood corpuscles. The Noguchi test was positive. The blood pressure is 130 in recumbent position.

Blood Examination.—Red blood cells 4,780; white blood cells 8,200; hemoglobin 85 per cent.

The reason for presenting this case is the question of diagnosis; otherwise the conditions apparent here are not unusual. Personally, I feel that the diagnosis of a brain tumor should be questioned; at least at this time such a diagnosis cannot be made nor can a brain tumor be excluded. The history of the present illness, its onset and development, so far as it can be obtained, as well as the findings at this time do not altogether favor the diagnosis of a brain tumor. Although the history of the present illness is very meager, it seems from the facts at hand that the severe headache and the gradual failing vision were the only symptoms present prior to the operation. The hemiplegia and the ocular palsy are postoperative conditions. If a brain tumor was suspected, it surely could not have been located in the motor region. Any symptoms resulting from a lesion there would have been noticed by herself and those around her. That there is no headache now, no nausea nor vomiting since the patient entered the hospital or before as far as we know, no increased intracranial pressure, no choked disc, but a postneuritic optic atrophy, would indicate that whatever may have caused the intracranial pressure was relieved by the operation.

The close association of the trauma with the beginning of the present illness, the rather sudden onset of the blindness, although temporary at first, was soon followed by a gradual failing of vision, also the persistent and severe occipital headache accompanying these symptoms with the resulting postneuritic optic atrophy would indicate that the pathologic process was an acute one at the beginning which subsided by reason of the operation or spontaneously. The most likely condition to which the development and course of the disease corresponds is an external pachymeningitis or a serous meningitis. The same cause which was active in the production of the meningitis also produced the internal hydrocephalus and the increase of fluid in the cortical meninges. A serous effusion or an exudate may develop either acutely or gradually in the ventricles

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and may cause symptoms which are usually recognized as occurring in brain tumor, and from which it is sometimes almost impossible to make a differential diagnosis. On the other hand, the symptoms of a circumscribed serous meningitis or a pachymeningitis will in no way differ from those of tumor of that locality. The lumbar puncture, the examination of the spinal fluid and the examination of the fluid withdrawn from the protruding hernia show that there is no connection between the spinal canal and the cavity of the cerebral hernia. It appears that the protrusion represents a large cyst which is walled off and not connected with the intracranial cavities. The microscopic and chemic examination of the fluid give evidence of a localized active process involving the meninges. Whether this is the primary causative factor is also questionable. Nevertheless, an acute or chronic serous meningitis occurring in the adult may be only an acute exacerbation of an old process which had its origin quite early in life. However, there is no question that in the adult a serous effusion may develop either acutely or gradually in the ventricles and cause such symptoms as are exhibited in this case. A history of a preceding injury to the head is quite common in pachymeningitis, and the symptoms may come on rapidly or slowly with remissions and exacerbations.

341 Liberty Street East.

DISCUSSION.

DOCTOR GEORGE SLOCUM: This case is of considerable interest from the standpoint of the eye examination. The evidences of postneuritic atrophy are very distinct. They are such as may be seen in cases where there has been a definite swelling or choked disc. In this case, judging from the eye condition alone, some form of optic neuritis has in all probability been at some previous time present. Even though there is now no increased intracranial pressure, this condition may have existed some time in the past. If a choked disc had then been present, it must have disappeared with the disappearance of the increased pressure. In the case under discussion, postneuritic atrophy has taken place; this would be and is the usual history of cases with choked disc from intracranial pressure where the condition continues long enough to cause changes in the structure of the nerve fibers; therefore, too much reliance cannot be placed on either the absence of such strong evidence that at some time in the past history there has been a severe optic neuritis or papilledema. Of course, optic atrophy may follow optic neuritis which is not of the character of nor the amount of swelling sufficient in degree to consider the case one of choked disc or papilledema, but in these cases the evidences of secondary atrophy are not as strongly marked.

The white patches and the white spots about the nerve head given in the report of the ophthalmoscopic examination show that there

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have been hemorrhages most probably at the time of the optic neuritis, and they further show, when considered in connection with the character of the atrophy, that the swelling of the nerve head was marked and, therefore, strongly suggest the probability that there was true choked disc or papilledema present at that time.

REPORTS OF CASES.

A CASE OF BILATERAL CERVICAL RIB.

JOHN H. PETTIS, M. D.
Department of Surgery.

Mr. H., laborer, aged twenty-nine, presented himself at the University Hospital December 28, 1911, for diagnosis of a tumor on the left side of the neck.

His past history is without interest except possibly the fact that at eleven years of age and again eight weeks ago he had an attack of "suffocation" as he expressed it which was diagnosed by the attending physicians as asthma. These attacks lasted but an hour or two each time but left the patient feeling somewhat weak for a day or two. At the time of the last attack the attending physician discovered the tumor in the neck and diagnosed it as a cervical rib.

On examination a smooth, hard, slightly movable mass about the size of a pigeon's egg was felt just above the middle of the clavicle. Its anterior end was fixed but its place of attachment could not be made out. Posteriorly it was evidently attached to the vertebral column. There was no tenderness and no pulsation over the tumor.

The *x*-ray picture which I present shows a very interesting condition. You will observe that there is an extra rib on either side although the one on the left is much more prominent and is more easily made out. You will also notice that the left rib is made up of a proximal and a distal portion between which there is a distinct joint. Whether or not the distal portion is connected with the first rib cannot be definitely determined, although it very probably is. The proximal portion evidently articulates with the upper portion of the seventh cervical vertebra. The rib on the right side is lower and more obliquely placed, making its exact relations rather difficult to determine. This position of the right rib accounts for the inability to feel it on examination.

Since it seemed unlikely that the presence of these cervical ribs had anything to do with this patient's symptoms operation was not advised.

DISCUSSION.

DOCTOR GEORGE L. STREETER: I do not know that I can add anything further to this particular case. I did not see the patient and I have only just now seen the radiograph.

These drawings illustrate the development of a typical vertebra

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and show how the cervical vertebræ have a part homologous to the rib as found in the thoracic region. All vertebræ have a pair of costal processes, but it is only in the thoracic region that they ordinarily form ribs.

The arrangement of the vertebræ at the lower end is usually influenced by the place where the limb lies. It is very apparent that we are descended from people who had a larger thorax than we and that we are on the downward grade with regard to development of the thorax. Our ancestors probably had thirteen ribs and more. The number of ribs is apparently dependent upon the size of the viscera. If we had more viscera we would have a greater number of ribs, and if we could experimentally displace the viscera and keep them up in the neck we would have ribs throughout that whole region. Their number and situation are determined by the position and size of our thoracic viscera.

With regard to the arm and leg we can perform such experiments and displace the arm or leg bud forward or backward. When the leg bud is thus experimentally altered in position, the lumbar plexus has been shown to be developed higher or lower according as we displace the bud. In the same way we can displace the arm bud.

In adults we usually find the variations in the ribs in the lower thoracic and lumbar regions; variations in the upper thoracic and cervical regions are much less frequent. I have not looked up the exact figures, but I think cervical ribs are found in one or two per cent of the cases. We may have just an enlargement of the costal process, more or less detached from the transverse process. This is common. There are all stages between this and the complete rib. The well developed seventh rib is reported in less than one per cent of the cases; they probably occur more often than that for they are often overlooked. We had a case of completely developed cervical rib in the dissecting room last year and did not see it until near the end of the dissection.

In the radiograph Doctor Pettis pointed out the presence of an apparent joint in this case which is an interesting feature, for in certain of the other vertebræ, in the sauopsida, joints of that kind are the normal occurrence. In birds as a rule one gets joints in the ribs, and this would be a reversion to that type, but it might also be interpreted that here one has the posterior part of the rib well ossified and that the apparent joint is due to the fact that the rest of the rib may be fibrous, that is, an imperfectly formed rib. Where cervical ribs are present the rule is that the scalenus muscles are attached to their upper surface, that is, the cervical rib assumes the relations of the first rib. The subclavian artery and cervical plexus usually pass over the rib.

Doctor Matthew Kollig: I would like to demonstrate these

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two specimens which have a direct bearing upon the subject under discussion.

This first specimen is a seventh cervical vertebra showing a well marked costal element on both sides. The left costal element is longer than the right, is completely detached from the true transverse process, and resembles a rudimentary cervical rib.

The second specimen shows a complete cervical rib coming from the right side of the seventh cervical vertebra, resembling in form the ordinary first rib, possessing a well formed costal cartilage and has a sternal articulation in common with the first rib.

DOCTOR JAMES G. VAN ZWALUWENBURG: What is the explanation of an interpolated rib? We discovered one accidentally in an *x*-ray for diagnosis in a suspected case of tuberculosis. I think it lay between the seventh and eighth ribs on the left side and had no attachment to the vertebræ at all. It articulated with the rib below by a definite articulation. There was a raised knob with a nice articular surface at about the position of the angle of rib below. The extra rib had a definite neck and angle, but the anterior attachment could not be made out. The radiogram was taken with the plate to the back and the image of the structures in front was so diffuse that it was impossible to make out exactly what became of its anterior extremity. The patient was a young woman and the condition had never been suspected.

DOCTOR STREETER: Forked ribs undoubtedly do occur and we have such a specimen over in the laboratory. It is a forking of a rib and there is no real explanation except that we find it in the cadaver now and then. There is evidently disturbance in the growth and for some reason they become bifurcated, perhaps the presence of some small blood-vessel in the early stage bifurcates the blastomere. It is a pathologic condition. The forked rib has a distinct articulation. Where it is a forward bifurcation, we often find two costal cartilages each articulating with the sternum. Where the bifurcation is not complete at the sternal end a joint is frequently formed with the next adjacent rib.

DOCTOR PETTIS (closing the discussion): As Doctor Kollig has said this condition is usually bilateral although one rib is usually much more developed and more prominent than the other. It has been estimated that only about ten per cent of the cases of cervical rib give rise to symptoms and these symptoms are very rarely bilateral but are confined to the side on which the rib is most developed. Whether or not these ribs give rise to symptoms depends upon their relation to the cervical plexus and the subclavian artery. When they are of considerable length, that is, five or six centimeters or more, the plexus and artery usually pass over them and when this anatomic arrangement obtains certain vascular and nervous symptoms may arise. These vascular symptoms are due to disturbed arterial supply

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to the arm and consist of paleness, coldness to touch, et cetera. Rarely gangrene has occurred in the soft parts of the finger tips following thrombosis of the brachial artery which is said to occur in a considerable number of these cases. The nervous symptoms are such as are brought about by pressure on nerves such as pain, paresthesias, et cetera. Singularly enough, there is seldom swelling of the arm, probably due to the fact that the subclavian vein, owing to its lower and more median position, is rarely involved.

Another curious and interesting thing in connection with this condition is the fact that the artery, just distal to the point where it passes over the rib, is often very much dilated and this dilation often gives rise to the suspicion of aneurysm. Why this dilation should take place distal to the rib is not very clear but is possibly explained by a thrombosis of the brachial which is common in vascular disturbances of cervical rib.

The operation for the removal of a cervical rib is not a very difficult one. The incision may be made parallel to the clavicle or it may be vertical or obliquely vertical between the sternomastoid and the trapezius. Or a combination of the two incisions may be made, any incision that gives plenty of room. The dissection must be made carefully in order to insure against injury to the plexus and artery and also the pleura which is often attached to the lower portion of the rib. In general the results of the operation have been very satisfactory and no mortalities have been reported.

A FATAL CASE OF ECLAMPSIA.

HOWARD H. CUMMINGS, M. D.
Department of Obstetrics and Gynecology.

Mrs. M. E., aged thirty, a primipara, was brought into the hospital in an unconscious condition, on the morning of December 17, 1911. Her history, which was obtained from the husband, was negative until the day previous to her entrance. The patient had always been well and from the beginning of her pregnancy, seven and one-half months previously, had manifested no signs or symptoms of intoxication. On the evening of December 16, 1911, while seated in a chair she was seized with a terrific pain in the epigastric region. The patient described this pain as stabbing in character, beginning in front and passing through to her back. Her husband rubbed the chest and back with liniment and applied a mustard poultice. These measures gave no relief and soon she complained of a severe headache in the frontal region. In less than an hour from the time of onset of the epigastric pain, the patient fell to the floor and had a violent convulsion. During the night she had four convulsions and did not regain consciousness between the attacks. The following morning she was conveyed eight miles in an ambulance and during this trip she had two more convulsions.

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Examination.— The patient was very fleshy. Her face was flushed; the eyes were fixed with the pupils dilated; there was but slight edema of the eyelids. The lips were dry and blood stained, the tongue was swollen and bleeding, the breath was very foul. The breasts showed the usual signs of pregnancy. The abdomen was large and flabby. The fundus of the uterus was located about half way between the umbilicus and ensiform. The fetus could be mapped out in the occiput left anterior position, its heart beat could be heard in the left lower quadrant of the abdomen; the rate was about sixty beats per minute. On catheterization about eight ounces of very dark, smoky urine was obtained. Examination of the urine showed red blood cells, numerous granular casts and about one-half volume of albumin. The rectum was impacted with fecal matter. Pelvimetry showed a normal sized pelvis. A systolic blood pressure of 160 millimeters of mercury was recorded by the Faught instrument.

During the examination the patient had several severe convulsions. These attacks began as a slight twitching in the hands and facial muscles which gradually spread and increased in severity until the whole body was involved in a clonic convulsion. The face and neck became cyanotic, the superficial veins stood out prominently, the breathing became labored. The jaw was firmly set. Urine and fecal matter were voided during these attacks.

Treatment.—Heavy blankets were placed over the patient and she was surrounded with hot water bottles. A towel was forced between the teeth to prevent any further damage to the tongue and lips. Two enemas were given to clear the lower bowel. Without administering an anesthetic an attempt was made to empty the uterus rapidly. However, after the cervix had been exposed and seized with a tenaculum it was evident that vaginal Cesarean section was impossible because the cervix could not be drawn down into view. The child's head had descended so far into the lower uterine segment that the cervix was almost immovable. The cervix was soft and the convulsions had dilated it enough to allow two fingers to be inserted. The dilatation was completed by the manual method of Harris. This consumed twenty-five minutes. When the hand could be easily passed into the uterus, the membranes were ruptured and an attempt made to do an internal podalic version; however, the small amount of amniotic fluid and the tonic condition of the uterus made this impossible. Axis traction forceps were applied to the child's head and the delivery was accomplished without difficulty. Judging from the fetal heart rate the child was moribund before the operation was begun and all attempts at resuscitation were useless. The mother's pulse at the end of the operation was 148 per minute. One-half pint of blood was drawn from the basilic vein of the right arm and fifteen ounces of salt solution was introduced under each breast. The convulsions continued, but were milder and occurred

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at longer intervals; however, during a slight convulsion the patient expired. In all she had twenty-one eclamptic convulsions.

There are only a few points about this case that I wish to emphasize. In the first place this was a typical example of the fulminating type of eclamptic intoxication. The patient never regained consciousness after the first seizure. Epigastric pain, which is always mentioned in textbooks but rarely found in these cases, was the first symptom. Frontal headache which usually precedes the eclamptic convulsion for several weeks or days, came on just before the seizure. The blood pressure which is usually markedly increased was but slightly increased. This fits in well with the fact emphasized by Bailey in a recent article on blood pressure in eclampsia. He says that in the severe cases of eclampsia, where the body can offer but little if any resistance, the blood pressure is relatively low. This fact is of prognostic value.

Naturally a rapid method for evacuation of the uterus as vaginal Cesarean section was indicated but the case illustrates one of the conditions where this operation cannot be used, namely, a cervix that cannot be brought down into view. Although evacuation of the uterus and eliminative means, such as blood-letting and salt solution seemed to modify the convulsions, they continued to a fatal termination.

DISCUSSION.

Doctor George Kamperman: There was nothing very unusual about this case of eclampsia. This complication is always interesting because it is rare and because it is so severe. The onset was a little unusual and the course was rapidly progressive, but on the whole that is the rule in eclampsia. Probably the one unusual and interesting thing from the operator's standpoint was the inability to perform vaginal Cesarean section. The cervix could not be pulled down, therefore could not be incised. It was suggested by Doctor Cummings that the patient possibly was not deeply enough anesthetized. Although the patient was unconscious, yet the uterus was tonic and the fact that she could not feel pain probably did not mean that the muscles were relaxed. If a little more anesthetic had been given and the uterus had been a little more relaxed it might have been easier to have pulled down the cervix and pushed up the head in order to do the version. However, there are no doubt cases where the cervix cannot be pulled down. There was a patient in the clinic about four years ago on whom Doctor Witter performed a manual dilatation because the cervix could not be pulled down, and this patient was deeply anesthetized. I think this contraindication to the operation is something rarely spoken of and should be recognized.

Doctor John A. Wessinger: One cannot help but be interested in this subject and I am glad that I listened to the report.

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The fortunate thing about the whole question is that eclampsia is rare. It is strikingly interesting to see the rapidity with which the poison, or whatever it may be, overwhelms some of these patients. From comparative health they are brought in a few hours to the point of death. Looking back over quite a wide range of experience in obstetrics I recall but two cases I have seen, one antepartum the other postpartum and I prefer the former to the latter. I am inclined to think that when called to an antepartum case, rather rapid pushing of the anesthetic and emptying of the uterus is the thing to be preferred, and I can see where vaginal Cesarean section would be indicated in some cases although contraindicated in this particular case. In the case I saw we had no difficulty in getting the patient under the anesthetic. We delivered the patient without complication and she made a rapid recovery. Since the condition is undoubtedly due to a poisoning of the system, elimination in every possible way and through every channel is of course indicated. The essayist spoke of hot baths. After or in the presence of convulsions such measures are very slow. Surprising to me also and quite common, are the cases where there is much albumin and almost complete suppression of urine, yet pregnancy and labor are completed without convulsions. I remember a number of cases of this kind. Another patient with an equal degree of albuminuria and suppression of urine will be the subject of the severe and fulminating type of eclampsia. The postpartum type, looking back over what little I have seen of the disease, is much more difficult to handle. In these cases emptying the uterus has not seemed to get rid of the cause of the trouble, hence the cases are the more likely to be fatal.

Doctor George Slocum: I have had two cases of eclampsia in my own practice. On the first one an abdominal Cesarean section was done. The patient did not live and the child also died. In the second case veratrum viride given in full doses for several hours seemed to help in controlling the convulsions. An interesting feature about the second case was that during the administration of the chloroform the pulse seemed to slow down and become regular. I should like to ask the opinion of the speaker in regard to the use of veratrum viride in puerperal eclampsia.

Doctor Dean Loree: This paper recalls an article by Doctor Peterson two or three years ago, relative to decapsulation of the kidney in certain cases of eclampsia. I should like to ask Doctor Peterson the status of this procedure at the present time.

Edebohl's operation seemed very much in disfavor for a number of years, but I have noticed with much interest that decapsulation of the kidney is gaining the approval of many conservative surgeons for certain renal conditions, and with most excellent results.

Doctor Reuben Peterson: The case just reported illustrates very well the serious nature of certain forms of eclampsia. Un-

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doubtedly the patient was very thoroughly poisoned and died in spite of and not because of the treatment adopted. My own statistics collected from many thousand cases show that the sooner the uterus is emptied after the advent of the first convulsion, the better will be the results. The mortality curve rises steadily the greater the number of convulsions before the uterus is emptied. This particular woman was unfortunate in that treatment was delayed. She might have succumbed anyway but her chances were lessened by the large number of severe convulsions prior to the operative procedure. Still, even in apparently desperate cases with many convulsions the operative procedure is indicated since some patients recover after many convulsions, even after as many as one hundred and fifty.

The absence of deep anesthesia cannot explain the impossibility of drawing down the cervix. Craigin and others cite this as one of the contraindications to the operation even where the patients are deeply anesthetized. Only exceptionally is it impossible to draw down the cervix. Hence vaginal Cesarean section is preferable in the large majority of cases to manual dilatation because it is a more accurate operation, is quicker and there is less likelihood of tearing the cervix.

Even although we were very careful in this case there was a tear of the cervix up into the broad ligament and this occurred in a hos pital where we had every advantage. One can imagine how often it occurs in private practice where there is very little help and unfavorable surroundings.

Some good results have been reported following decapsulation of the kidneys for eclampsia. But the efficacy of the operation is limited to the kidney type of eclampsia. In other types of the disease, where there are lesions in the brain and liver, decapsulation will avail not at all. The published reports of cases where the operation was employed are not fair to the latter because the procedure was employed indiscriminately on all kinds of cases and often as a last resort.

I am now engaged in a research work on abdominal Cesarean section for eclampsia. This operation has given bad results in the past, statistics showing a mortality as high as fifty per cent. While I am not ready to report at the present time, the mortality is much less than this in the three hundred and fifty cases I have collected. Undoubtedly this is due to the more frequent employment of the operation in more favorable cases. One operator has had fourteen cases of eclampsia treated by abdominal section with one death. Formerly the operation was performed as a last resort upon desperate cases, where it was not much more than antemortem Cesarean section.

Doctor Conrad Georg, Jr.: Like most of the other practitioners, I have had two cases of eclampsia. The first case was several years ago; the patient was taken sick in a car on a railroad train. She could not be treated at that place, so I sent her to the hospital. She

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had had several convulsions, and Doctor Peterson dilated the cervix, extracted the child, and she recovered. In the second case, Doctor Peterson performed a vaginal Cesarean section, which was done after the third convulsion, and the patient made a very satisfactory recovery.

One point occurred to me in the treatment of the case described by Doctor Cummings. It might not have made any difference in this particular case, but it occurs to me that after extracting the blood, one could get very immediate effects by injecting salt solution into the vein; it would be absorbed more readily, and if any benefit were obtained, it would be more rapid than by injection into the cellular tissue. This point I consider of great importance if the salt solution is to be of any benefit. Of course, it is absorbed more slowly through the tissues of the breast, and it is a question whether there is much benefit to be derived from that kind of injection. If injected directly into a vein and the patient is not moribund, it ought to be of some benefit.

Doctor Cummings (closing the discussion): In regard to the treatment of eclampsia with veratrum viride, Bailey has shown that the blood pressure can be lowered by this drug to such an extent that true shock is produced. He has found a reduction of over one hundred millimeters of mercury in some cases. Williams makes the statement that in the East India medical service, where veratrum viride was used for twenty years, the maternal mortality was forty-five per cent.

The use of chloroform to control the convulsions has been known to produce necrosis of the liver and symptoms of chloroform poisoning. The fetal mortality is undoubtedly increased by the use of chloroform for any length of time.

The case reported was certainly fulminating in type, and unless the case had been seen very early, it is questionable if any line of treatment could have saved her.

PRESENTATION OF SPECIMENS OF ADENOCARCINOMA OF EACH OVARY.

REUBEN PETERSON, M. D.
Department of Obstetrics and Gynecology.

The patient, Miss M. T., aged twenty-two, was referred to me by her physician, Doctor Branch, of East Tawas, Michigan, for an abdominal tumor she had noticed for about two or three months. The patient was a fairly well nourished young woman, who had been in fairly good health up to July, 1911, when she began to lose strength. Her appetite became poor and she suffered at times from nausea and vomiting and gaseous distention. About December 18, 1911, she was seized with a severe pain in the left abdomen, and the latter has been tender ever since. She has lost considerable weight.

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Since August she nas suffered from frequent and difficult urination. Her menstrual periods began at the age of twelve and have always been regular—of the four weeks' type. She has never had much pain at the periods nor were the latter apparently affected by her present trouble.

Examination, under anesthesia, December 22, 1911, showed an irregular abdominal swelling with one mass reaching slightly above the umbilicus on the left side. There was a smaller mass on the right side which was firm, freely movable and apparently disconnected with the uterus. An indurated mass could be made out in the posterior culdesac. This, together with the gradual loss of flesh and strength, led to the diagnosis of malignancy, in spite of the youth of the patient.

The abdomen was opened by a median line incision, giving exit to a quart or two of bloody ascitic fluid. The abdominal masses proved to be ovoid, slightly flattened tumors of each ovary. The right was almost three inches and the left four inches in diameter. Both were slightly adherent, but were easily removed. Metastases were found behind the uterus, through the mesentery and on the parietal peritoneum.

The patient was under the anesthetic not longer than half an hour and has had no reaction or pain since the operation. The wound healed by primary union. This is the first case of bilateral, solid adenocarcinoma of the ovary I have had in a fairly large hospital and private gynecologic practice. More often in carcinoma of the ovary the tumor is cystic and unilateral. Out of one hundred and thirty-eight cases, Kelly had nine cases of adenocarcinoma of the ovary. Of these four were solid tumors. At first sight these tumors resemble ordinary solid fibroid growths of the ovary, but microscopic examination showed them to be malignant.

On account of the extensive metastases the prognosis is absolutely hopeless.

DISCUSSION.

Doctor George Kamperman: Probably the most unusual thing about this case is the patient's age. It is very unusual to find tumors in a girl of twenty-two; at the same time, if such patients do have tumors, there is always a great possibility of malignancy. Sometimes we rule out malignant disease because the patients are young, and forget that tumors in the young are quite likely to be malignant. Tumors at either extreme of life, in the very old or in the very young, frequently fall in this class.

At the time of operation it was thought that most likely the tumors were sarcomatous because of the fact that ovarian tumors in young girls generally are of this type. The microscopic examination

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was very interesting. Doctor Warthin found the diagnosis to be adenocarcinoma with tall columnar cells in the glands, which had undergone mucoid change, and his opinion is that the tumor probably originated in the intestine or in some dermoid elements in the ovary. Clinically, it does not look as if this tumor could have originated in the intestine. More likely the ovary itself was the starting point, and it is possible that there were dermoid elements in the ovary.

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TRANSACTIONS
OF THE
CLINICAL SOCIETY
OF THE
UNIVERSITY OF MICHIGAN

STATED MEETING, FEBRUARY 7, 1912.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.
REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS.

THE USE OF PANTOPON IN CONTROLLING THE PAINS OF LABOR.

WILLIAM H. MORLEY, M. D.
DETROIT, MICHIGAN.

THE present tendency to improve the pharmacopeia seems to be not so much in discovering new drugs as in purifying those already existing. The next few years will no doubt witness the advent of many of the old medicaments in a new and purified form. The discovery of digipuratum, a pure form of the former infusion of digitalis, the isolation of the active principle of the suprarenal glands, and the production of a new drug, are a few examples of this tendency toward an improvement and betterment of the list of drugs at present found in the pharmacopeia.

It is but a few years since Sahli, working upon a new and pure form of opium, discovered a compound to which he gave the name pantopon. The word comes from the Greek and means all the juice (*pan* = all; *opus* = juice). This new preparation, freed of all the extraneous and inert substances, such as waxes, resins, guttapercha, et cetera, is freely soluble in water and contains all the alkaloids of opium in the form of their hydrochloric salts. Pantopon contains 89.77 (about ninety per cent) of all the alkaloids of opium. Opium itself has about fourteen to fifteen per cent of the alkaloids. Hence, 1.0 grain pantopon = about 5.0 grains opium. This new preparation and its solutions are colored a light brown. The watery solution reacts weakly acid to litmus, which reaction is due to the weak basicity of

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the opium alkaloids in contrast to the strong hydrochloric acid. Since it does not contain free hydrochloric acid, and since it is used in dilute solutions only, the subcutaneous injections are not painful. On account of the watery solution, which is the form most often employed for hypodermic injection, the precipitation of the salts is prevented in the presence of the body fluids, which precipitation occurs almost immediately, when the alcoholic tincture of opium is injected, while the extract opii aqueosum depuratum does not keep all the alkaloids in solution.

The extensive biologic and pharmacologic investigations of Rodari, Wertheimer, Loewi, Bergien, *et al.* with pantopon are most interesting and reference will be made to their results later on, résumé of their work being left for another paper.

Pantopon, since it was disclosed by Sahli early in 1909, has been quite extensively used in all branches of medicine. It might not be uninteresting to review some of the more important articles and mention the conclusions that each investigator has deduced from pantopon in his special branch of medicine.

The first of these, of course, was Sahli. He used pantopon in internal medicine, as a substitute for opium and morphin, and found that pantopon could be used in any case where either morphin or opium was indicated. The results, in cases of perityphlitis, diarrhea, peristaltic unrest and colicky cramps, were most satisfactory. No complications, such as nausea and vomiting, constipation, and excitation, followed its use. The combination of the alkaloids in pantopon is a fixed one and hence permits an accurate dosage. The drug may be given in a number of ways, hypodermically, per os, or per clysma. For hypodermatic application a two per cent solution of pantopon is generally used. This solution, which contains two per cent pantopon, is made with seventy-five per cent water and twenty-five per cent glycerin. While such a solution does not require sterilization, as the glycerin acts as an antiseptic, still it may be subjected to boiling without any alteration of its efficiency. The dose per hypodermic is 1.0 cubic centimeter of the two per cent solution. Internally, it may be given in the form of pills, tablets, or powders of 1.0 to 2.0 centigrams.

Soon after the publication of Sahli's results, many other internists tested the efficacy of pantopon. The results of Hallervorden, Pertik, Ewald, Doblin, *et al.*, confirmed those of Sahli, that pantopon, allowing a fixed and accurate dosage, as its alkaloidal content is known, acts, in cases where either morphin or opium is indicated, more quickly and without the usual unpleasant complications that follow the use of morphin and opium.

Pantopon has been used by the psychiatrists with good results. Hayman, who used this new opium preparation in a large number of cases, concludes as follows: "The value of pantopon in psychiatry resides mainly in the fact that it is admirably adapted to subcutaneous injection; consequently, it acts promptly and can be administered to

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obstreperous patients. Its chief action is less the hypnotic than the sedative, and the latter in turn manifests itself to best advantage in cases of excitation characterized by fear, but it acts well in other cases. The after-effects are not material ones, in many cases they are wanting entirely. Tolerance is not established." The results of Tomaschny, Becker, Morell-Lavallée confirmed those of Hayman.

The use of pantopon as a substitute for morphia in morphin scopolamin anesthesia was next investigated. The literature upon this form of use is rich and many interesting and valuable articles have from time to time appeared. A résumé of the conclusions of numerous investigators upon pantopon anesthesia is as follows:

(1) Pantopon puts the patients before operation in an apathetic, somnolent condition and thus removes the last terrors just before the anesthetic is commenced.

(2) Duration of the ether anesthesia and the amount used are apparently lessened.

(3) With pantopon-scopolamin alone, without the aid of ether, certain gynecologic operations could not be performed.

(4) In vaginal operations, it is only necessary to etherize until a relaxation of corneal reflexes takes place. After this, only a small amount of anesthetic is necessary,—under some conditions no more ether is required.

(5) In laparotomies, one requires during the operation, on the average, as much ether as one does to anesthetize.

(6) The sleep, during anesthesia, is deep, quiet and without salivation. The pulse and respiration remain undisturbed.

(7) In the postoperative period the sensitiveness to pain is, during the first twenty-four hours, absent.

(8) Nausea and vomiting take place only in exceptional cases. The movement of the bowels and passage of flatus are not retarded after the use of pantopon.

The brilliant results with pantopon, in internal medicine, in psychiatry, in connection with scopolamin as an adjunct to surgical anesthesia, naturally led to a trial of its efficacy in controlling the pains of childbirth. A more or less complete review of some of the more important articles upon the obstetric use of pantopon is necessary in order to properly present the subject as instanced by the title of this paper.

One of the earliest investigators was Jaeger, an assistant in the gynecologic clinic at Kiel. The method recommended by Gauss and Krönig to produce so-called "twilight sleep" by means of scopolamin and morphin was tried and, after an experience covering a large number of cases, the method was abandoned, owing to the dangerous effects upon both mother and child. The bad effects seemed to come from the morphia. The next step was to try this new opium preparation, recommended by Sahli, to lessen the sensitiveness of labor pains without any appreciable diminution of their force and at the same time obtain, by the use of pantopon in connection with scopolamin, a smaller

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necessary dose of the latter, or to prove that the scopolamin was superfluous. The ultimate aim was to discover a relatively safe method of easing the pains of labor.

Jaeger's investigations cover fifty cases. In twenty cases pantopon was used alone; in thirty cases it was used combined with a small dose of scopolamin. In the first twenty cases, in which pantopon alone was given, the method was as follows: 0.5 to 1.0 cubic centimeter of a two per cent solution of pantopon was injected subcutaneously, usually during the first stage of labor, sometimes during the second stage, depending upon the frequency and intensity of the pains. If no action appeared, the dose was repeated in about one hour. The effects produced differed somewhat. In most cases, however, from one-fourth to one-half an hour after the injection of the pantopon, there appeared a gradual alleviation of the sensitiveness of the labor pains. In some cases where the sensitiveness of the pains was slight one-half of one cubic centimeter was enough, in other, the dose must needs be repeated. The action of the drug usually lasted several hours. The lying-in patients, who had previously been loud in their complaints, were quieter, and between pains they were often asleep. The labor pain itself could be felt clearly by the hand of the accoucheur upon the fundus, but its sensitiveness had disappeared. During the second stage, the patients bore down energetically. A lack of abdominal pressure was not noticed. The pains, which before and after the injection were accurately observed up to the time of delivery, showed no irregularity as regards their frequency, intensity and duration. The prompt action of pantopon was lacking in a few cases. In six cases, mostly primiparæ, the injection of 1.0 cubic centimeter pantopon had no apparent effect upon diminishing the sensitiveness of the pains. With a repetition of the hypodermic in three cases, a condition of quiet was produced. In three cases the second dose produced prompt action. It must be mentioned, parenthetically, that large doses of pantopon (two cubic centimeters) do not appear to be without harm for the child, for, in one of the three cases above mentioned, the forceps had to be applied, as the fetal heart fell below 100 beats per minute. In another case the child was asphyxiated and only lived after many attempts at artificial respiration.

Jaeger's inequality of results with pantopon alone, led him to combine it with relatively small doses of scopolamin. He injected simultaneously 1.0 cubic centimeter of the two per cent solution of pantopon and 0.0002 to 0.0003 gram scopolamin hydrobromate, depending upon the severity of the pains, starting with 0.5 cubic centimeter pantopon and 0.0002 gram scopolamin and repeating if necessary.

In thirty cases so treated, the action was similar. In two cases only was the result entirely satisfactory. Although an amelioration of the hitherto sharp pains could be made out, still the patients complained so vigorously during each pain, after the first injection (1.0 cubic centimeter pantopon + 0.0003 gram scopolamin), that, in one

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case, 1.0 cubic centimeter pantopon + 0.0002 gram of scopolamin and in the other 0.5 cubic centimeter pantopon + 0.0002 gram scopolamin, were injected with a complete result. In the first of these two cases the fetal heart dropped to about 100 beats per minute. The child was born spontaneously but for a long time was apneic.

In labor with a very long second stage, due to a contracted pelvis, six hours after the first injection (1.0 cubic centimeter pantopon + 0.0003 gram scopolamin), the dose was repeated with good results. The child died twelve hours after delivery from a cerebral hemorrhage. In several cases of a long labor, a second injection of scopolamin alone (0.0002 gram) without pantopon was tried. The result was most satisfactory.

An unfavorable influence upon the force of the pains was not noticed from the treatment of pantopon and scopolamin in combination. Only twice was the pause between the pains somewhat longer after than before injection (three to four minutes before; about five minutes after). The force and duration of the pains themselves remained uninfluenced.

From his fifty cases, twenty with pantopon alone and thirty in combination with scopolamin, Jaeger concludes as follows:

(1) Pantopon can be recommended to allay the sensitiveness of labor pains, but it should be further investigated.

(2) In combination with a small dose of scopolamin hydrobromate, the analgesic action is apparently increased.

(3) The administration of large doses of pantopon (2.0 cubic centimeters) is, since they appear not without danger to the child, to be made with extreme care.

(4) In a majority of cases, however, 1.0 cubic centimeter pantopon is entirely sufficient.

The next investigator to employ pantopon to control and ease the pains of childbirth was Aulhorn. He used pantopon alone in ten cases and found that in only three cases was an amelioration to be noticed, while at the same time a prolongation of the labor took place. He injected 0.5 cubic centimeter of a two per cent solution of pantopon and repeated the dose in one hour. Then Aulhorn used pantopon in combination with scopolamin. His results were most uniform. The method he employed was as follows:

At the beginning of the labor, when the pains were strong and followed each other in equal periods, and when the patient found the pains were really sensitive, he injected 0.01 gram pantopon + 0.0003 gram scopolamin. After one-half to one hour, according to the severity of the action of the two drugs, he injected 0.01 gram pantopon + 0.00015 to 0.0003 gram scopolamin. A further injection of 0.01 gram pantopon was only made in a few selected cases for reasons as stated later. The above method was used in one hundred cases. In the successful ones the course was as follows:

Ten to fifteen minutes after the first injection, the patient experi-

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enced a certain feeling of drowsiness. Excitable women became quieter. The contractions were stiil somewhat painful but, in most cases, a certain amelioration of the sensitiveness to pain was not present. After the second injection, the patient lay, during the pause between pains, as if asleep, awaking at once when summoned to do so. The contraction itself was still clearly felt. Upon questioning, the patient stated that she still felt a slight drawing pain, especially over the sacrum, with each contraction, but that the labor pain was more endurable, much lighter than before injection. If one controlled the pain with the hand on the fundus, one felt that the patient gave vent to cries only at the height of the pain, while at the beginning and at the end of a contraction, she lay half asleep. This action lasted four to five hours, often longer, and was lost as soon as the strong pains of the second stage set in, and the secondary reflex contractions of the abdominal muscles commenced. Nevertheless, the sensitiveness to the pain appeared to be less in many cases, since the patient experienced strong and hard pains, but to them there was no amelioration of the contraction present. During the pause between the contractions, the patients remained quiet and, in consequence, bore down twice as well with each pain.

In a large number of these cases the course was not so successful; those in which the injection was made too late, when the labor was too near the commencement of the second stage, and when the pains were too strong and too sensitive to put the patient in the condition of partial sleep, which is necessary for the proper action of pantopon. In these cases it is possible that each result was a failure, either subjectively or objectively.

The second group of failures includes those which had a too early injection. Upon this point Aulhorn says if one is guided by the complaints and suffering of the patient and makes an injection before the periodic pains begin, then the patient drops into a sleepy condition after the injection, the period between the pains is prolonged and the labor itself lengthened to such a degree that one is unable to get any results from the first dose.

In a few of Aulhorn's cases, for some unknown reason, there was no effect whatever following the injection of pantopon, and he further states that an exact determination of how many cases were successful and how many were unsuccessful was scarcely possible because there exists no exact measure of the increase or diminution of the sensitiveness of each contraction.

In speaking of the complications resulting from the use of pantopon and scopolamin, Aulhorn reports that he saw no injurious effects follow in either mother or child from the use of this combined method. No hemorrhage, no headache, no dizziness, no excitement took place during the labor or the puerperium.

The injection of scopolamin and pantopon is contraindicated in

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abnormal positions, contracted pelves, and in early rupture of the membranes with weak labor pains.

All children were born alive—none was asphyxiated. Three children had a slight degree of oligopnea as is most often found after the scopolamin-morphin "twilight sleep." All three children were breathing in three to four minutes. One baby was delivered with low forceps because the fetal heart sank to 100 beats per minute.

The difference between pantopon and morphin, chemically, physiologically and biologically, is very clearly explained by this author. As was mentioned above, pantopon contains all the alkaloids of opium in a chemically pure form. It also contains morphin. The action of morphin in labor is well known. It lessens the sensitiveness of the pains, but also diminishes their force and is, in relatively small doses, harmful to the child. The reason for this is that pantopon contains, in addition to the alkaloids with hypnotic action, alkaloids which have a slight hypnotic but a strong reflex stimulating action; that is, the alkaloids of the codein group. These reflex stimulating components cause a partial paralysis of the hypnotic producing ones, so that during labor the paralyzing action upon the pain center is increased by this reflex-stimulating action. Or, expressed in another way, for this point is by far the most important fact in the explanation of the difference between pantopon and morphin, the alkaloids of pantopon acting as a whole, paralyze the sensory centers and have little or no effect upon the motor centers. Morphin, on the other hand, produces a paralysis of both sensory and motor centers. This difference explains the deleterious effect of morphin upon the child in the scopolamin-morphin "twilight sleep," because morphin lowers the frequency and volume of respiration by its paralyzing action upon the center of respiration. The action of pantopon upon the respiratory centers is either absent or present to a very small degree and, if it does exist, is only temporary, while the action of morphin may last for several hours.

These results applied to labor explain the beneficial action of pantopon in this way. During labor, the patient makes use of her entire respiratory efficiency, first, for herself because she is carrying out strong body work, and, second, for the child, whose supply of oxygen suffers in a normal way during each contraction of the uterus. If the frequency and volume of the respiration are lowered for a longer time by morphin, this will very readily cause harm, both to the mother and to the child, while this will not be the case from pantopon, which does not affect the respiratory centers, or, at least, for only a short time and never to a marked degree. This difference would seem to recommend pantopon as a good substitute for morphin, wherever it or opium is indicated. Another recommendation for pantopon is that it can be safely used in private practice among domestic cases, as the second injection, when necessary, can be safely left with a nurse for administration.

Kolde, another observer of the action of pantopon in controlling

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the pains of childbirth, reports his results in sixty cases, that is, ten with pantopon alone and fifty in which it was combined with scopolamin. The results in the ten cases, in which pantopon alone was used, showed three with no action and seven with only temporary relief. Of the three, two were primiparæ and one was a thirty-eight-year-old multipara whose last child had been born eight years before and who had very rigid soft parts. Of the seven cases, in which only temporary relief was obtained, two are worthy of notice. One was given pantopon, when the cervix admitted but one finger, and she commenced to bear down immediately afterwards. The other, when she commenced to bear down, felt less pain.

In the second series of cases, where pantopon was combined with scopolamin, the results were more satisfactory. During the first stage, when the cervix admitted two fingers, 1.0 cubic centimeter pantopon (two per cent solution) + 0.0003 gram scopolamin where injected. In one to three hours a second injection of 0.0002 gram scopolamin was given. Action was noticed in from twenty minutes to one-half hour. The contractions were felt, but were not sensitive. A feeling of drowsiness ensued and usually after the second injection the patient would lie as though asleep between pains, but could be easily aroused. After this the pains were no longer felt and the presence could only be determined by laying the hand upon the fundus uteri. In eight cases the patients had no remembrance of what took place. One felt a slight pain when the perineum ruptured. A tabulation of his result in the fifty cases is as follows:

No results—1 case, two per cent, contracted pelvis and pendulus abdomen.
An amelioration—16 cases, thirty per cent.
Good results—33 cases, sixty-eight per cent.

Of these thirty-three cases, sixty per cent experienced no pain and did not know when the delivery was made. In the reports of Gauss on scopolamin-morphin "twilight sleep," the similar per cent was eighty. This variation in the per cent of complete amnesia may be explained in this way. In cases where pantopon-scopolamin was injected only once, where it was injected too late in the labor or too near the end of the first stage, the result was apt to be nil, or very slight. Futhermore, one will get better results in private practice where the patient can be kept quieter.

In all his cases, Kolde did not observe that the labor was prolonged. The pains after injection came with the same frequency and were of the same duration and force. The pause between contractions was perhaps somewhat greater in some cases and, in others, the pains were stronger and came more often. In one case only did the contractions stop and then for several hours. This was due to a too early injection before the pains became regular. Kolde advises one to make the first injection when the contractions follow each other every three or four minutes. The cervix must be oblit-

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erated and admit two fingers. When dilatation is complete the injection is of no avail.

The complications following the use of pantopon-scopolamin were few. In one case, high forceps had to be used, as the patient had a contracted pelvis. The patients all bore down well during the second stage. The third stage was undisturbed. A few patients complained of thirst after the labor was over, but almost all fell into a deep sleep, lasting many hours after delivery.

In conclusion Kolde says that pantopon is an excellent drug to lessen the sensitiveness of labor pains. In combination with scopolamin, one can obtain a "twilight sleep" with complete amnesia. Pantopon alone, or in combination with scopolamin, is indicated in every case of childbirth where a normal pelvis and a proper position exist. Abnormal positions and contracted pelves contraindicate its use. Lastly, the method is entirely harmless to the child.

A few more obstetricians have used pantopon in their maternity cases, but perhaps those already reviewed will give a fair understanding of the various methods employed and the different results attained.

In order to work out the efficacy of this new opium preparation, as a means of making the process of child birth easier for both mother and child, some observations were made at the Woman's Hospital in Detroit. The method of administration was as follows:

A two per cent solution of pantopon was first made up in the following manner:

Pantopon	2.0
Aqua distill	78.0
Spir. vini optimi	5.00
Glycerin. pur. neutr	15.0

Misce. Signa. For hypodermic use, 1.0 cubic centimeter.

This solution was placed in glass ampules under sterile conditions, each ampule containing 1.0 cubic centimeter (equals one-third grain pantopon) of the above solution. When dilatation was complete, or, rather, when the second stage had commenced, 1.0 cubic centimeter pantopon was injected. From twenty minutes to one-half hour afterwards the action was felt and the patient stated that the contractions were much more easily borne. The action of the abdominal muscles and the force of the expulsive pains remained undisturbed. The patients bore down with vigor. The third stage showed no change. The general results were observed in thirty-four cases, a more complete analysis of which may be had by consulting the appended table, from which the following résumé of these thirty-four cases is taken.

The patients were all primiparæ and the average duration of the labor was—

First Stage	14¾ hours
Second Stage	3½ hours
Third Stage	25 minutes
Total length	18¾ hours

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In the average above are included Case VII and Case XIV, whose first stages were forty-seven and one-half and forty-seven hours, respectively. This would tend to make the average length of the first stage longer. The second stage was undisturbed. In Case XIV the third stage was five hours and twenty minutes long, due to a retained placenta for which the injection was not at fault. This case is not included in the above average of the third stage.

The injection of 1.0 cubic centimeter of a two per cent solution of pantopon was made during the second stage in each case. This was done because other investigators, in the opinion of the writer, made their injections too early in the course of the labor, especially where they used the pantopon alone. Whether it would be better to inject 0.5 cubic centimeter during the first stage and follow this up with a full dose (1.0 cubic centimeter) at the commencement of or during the second stage, must be left for another series of observations. In only two cases (Case XIII and Case XXX) were two injections made. In the first of these the first injection was given three hours before the second, during the second stage. The contractions stopped for one hour after the first injection. Six hours after the second injection, low forceps was applied, as the head made no progress, although the pains were of good frequency and duration. In the other case, the first injection was, through error, made soon after the first stage began and the second injection, three hours later, also during the first stage. The sensitiveness of the contractions was less, but the labor progressed slowly, the cervix took a long time (eighteen and one-half hours) to dilate, but the patient did not seem to suffer at any time during the labor. The second and third stages were uneventful.

COMPLICATIONS.

Complications, that could be traced to the action of pantopon, did not exist. In Case V, the contractions ceased for several hours, but no change i ntheir character was noted when they started again. In Cases VI and XIII, owing to lack of progress of the presenting part, low forceps was applied, although the pains were strong and of good duration. A severe hemorrhage occurred in Case VII one-half hour after the injection. Internal podalic version was performed. In this case the effect of the pantopon was lost one hour after the injection. The patient withstood the pain of contraction better while the effect lasted. After that, the sensitiveness was as severe as ever. The criticism here is that the dose should have been repeated from two to three hours after the first one. In Case XIV an adherent placenta complicated an otherwise normal delivery. No blame, however, can be placed on the pantopon. In Case XXXII, a breech presentation was encountered. Pantopon (1.0 cubic centimeter) was injected ten minutes before delivery, which took place without any untoward results.

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The effect of the pantopon upon the labor was doubtful, although the third stage was not influenced. It was unfortunate that an earlier in jection was not made.

RESULTS.

Observations, that are more or less dependent upon the statement of the patient, must be considered with extreme care. There can be no question but that the element of suggestion exists, as far as the patient is concerned, to a wonderful degree. Doubtless, in some of the cases reported above, an injection of sterile water might have eased the labor pains, according to a later statement of the patient. Patients are often too eager to answer in the affirmative when questioned as to whether a certain form of medication was successful or not. With this fact in mind, the following results are tabulated:

No results	2 cases	or ca. 6%
Doubtful results	3 cases	or ca. 8%
Fair results	8 cases	or ca. 24%
Good results	21 cases	or ca. 62%

As further observations will be made of the effect of pantopon in controlling the sensitiveness of the uterine contractions in childbirth, this paper is offered simply as a preliminary report. It is hoped that several series of investigation along this same line may be carried out; first, the action of pantopon when injected during the first stage; second, when used in divided doses; and third, the effects and results of pantopon given with scopolomin. The results of these various methods may then be studied and compared, and more accurate conclusions deduced.

CONCLUSIONS

From the investigations already made, from the cases reported, and from the original observations given above, the following tentative conclusions seem justifiable:

(1) In general, pantopon seems destined to replace morphin and the various tinctures and extracts of opium.

(2) It can be administered wherever opium and morphin is indicated.

(3) Pantopon has all the therapeutic action of these two drugs, without any of their unpleasant, dangerous after-effects.

(4) The observations, regarding the use of pantopon in internal medicine, in psychiatry, and as a substitute for morphin in surgical anesthesia, recommend its further use in medicine and surgery.

(5) In obstetrics, pantopon tends to lessen the sensitiveness of the uterine contractions, without changing the force and duration of the pains.

(6) It is also harmless for the child.

(7) Later investigations will doubtless determine and clear up many hazy points and establish, not so much a fixed dosage, as the proper time at which to make the injection.

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RECORD OF LABORS.

Case	Para	Duration of Labor (Hrs.) Stg. 1	Stg. 2	Stg. 3	Total	Inject During	Complications	Results
1	I	19½	2½	¼	22¼	Stg. 2	None	Good. P. felt less pain after. Pupils contracted.
2	I	8½	2½	½	11½	Stg. 2	None	Good. Force & freq. of pains same. P. suffering less.
3	I	8	1½	¾	10¼	Stg. 2	None	Injetcion given too late. 3rd stage prolonged.
4	I	15	1	¼	16 1/3	Stg. 2	None	Injection eased pains.
5	I	7	9	½	16½	Stg. 2	Pains ceased for sev. hrs.	No change when pains started again.
6	I	6	4	¼	10¼	Stg. 2	Forceps appld.	Pains less painful.
7	I	47½	5	1	53½	Stg. 2	Severe hemrg. Int. podalic version.	Effect of drug lost after ½ hr. Should have been repeated.
8	I	8	3	1/12	11 1/12	Stg. 2	None	Pains at first weaker but when ret. P. stood them better.
9	I	13	3	8 min.	16+	Stg. 2	None	Eased the pains.
10	I (1 & II)	2¾	4 1/12	5/12	7¼	Stg. 2	None	Eased the pains.
11		17	2 1/6	5/6	20	Stg. 2	None	Fine results. Experienced no pain but bore down well.
12	I	12	1¼	½	13¾	Stg. 2	None	No effect on pains.
13	I	25	9¼	¼	34½	1) Stg. 2 2) Stg. 2	Low Forceps	Pains stopped for 1 hr. after dose I. Dose 2 given 3 hrs l't'r.
14	I	47	3 1/6	5 2/6	55½	Stg. 2	Adherent Placenta	Pains easier. P. bore down well. Pains of good force.
15	I	9½	9¼	½	19¼	Stg. 2	None	Pains easier and force the same. P. bore down well.
16	I	9	3¾	½	13¼	Stg. 2	None	No effect.
17	I	?	1/6	1/3	?½	Stg. 2	None	Pains harder and longer but well borne.
18	I	?	?	¼	?¼	Stg. 2	None	As in No. 17.
19	I	13½	3 1/6	2/3	19 1/3	Stg. 2	None	As in No. 17.
20	I	12¾	3	½	16¼	Stg. 2	None	As in No. 17.
21	I	10½	3½	¼	14¼	Stg. 2	None	As in No. 17.
22	II	4 1/3	1 1/3	2/3	6 1/3	Stg. 2	None	As in No. 17.
23	I	7	2¾	¼	10	Stg. 2	None	As in No. 17.
24	I	21½	3	½	25	Stg. 2	None	Contractions harder & longer. P. said they were easier.
25	I	?	?	½	?½	Stg. 2	None	As in No. 24.
26	I	18	5 1/3	1/6	23½	Stg. 2	None	As in No. 24.
27	I	?	25½	¼	25¾	Stg. 2	None	As in No. 24.
28	I	12	3½	½	16	Stg. 2	None	As in No. 24.
29	I	16½	2 2/3	1/3	19½	Stg. 2 1) Stg. 1	None None	As in No. 24.
30	I	18½	2¾	½	21¾	2) Stg. 1		Labor progressed slowly. Cervix slow in dilating. Pains less severe.
31	I	17	2½	1/3	19 5/6	Stg. 2	None	Fair result.
32	I	6½	3	½	10	Stg. 2	Breech presentation.	Doubtful.
33	I	12½	1	½	14	Stg. 2	None	Good—P. a Greek.
34	I	17	2½	½	20	Stg. 2	None	Good—P. saw no help.

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DISCUSSION.

DOCTOR HOWARD H. CUMMINGS: I am sure we all appreciate Doctor Morley's interesting paper. We have had no experience here in using pantopon in obstetrics, but the results related tonight would surely justify its use in a series of cases.

For years workers in obstetrics have been trying various means to

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lessen or remove the pain of child-bearing. Hypnotism, autosuggestion and general anesthetics as ether and chloroform, have been tried. Morphin alone and in combination with hyocin and scopolamin has been tried, but serious drawbacks have been discovered. Infiltration about the pudic nerve with cocain solution just before the head emerged from the vulva controlled pain but idiosyncracies made this procedure dangerous. The injection of novocain for spinal anesthesia has been tried but it was found to be dangerous. Pantopon, an opium derivative, having the therapeutic properties of morphin but lacking all the disagreeable properties, should be an ideal drug for obstetric work.

Probably one of the most important uses of morphin in obstetrics has been its use in cases of uterine inertia. A rest of a few hours seems to modify the labor pains so that they become stronger and accomplish their aim. Whenever morphin is used in this way it has been noticed that there is difficulty in resuscitating the child. This objection might hold for pantopon, in fact Doctor Morley, in his review of the literature, mentioned the inability of an obstetrician to resuscitate a child and in another case the fetal pulse fell to a rate of less than 100 beats and the labor was terminated with forceps. He also mentioned a case of fatal cerebral hemorrhage in a child. Of course, there are several things that may produce a cerebral hemorrhage in the newly-born and as far as I know, morphin has never been found to cause hemorrhage but observers are coming to believe that the careless use of chloroform in obstetrics does produce a chloroform poisoning in the child and fatal cerebral hemorrhage.

In regard to Doctor Morley's work with pantopon, it would seem that a series of cases upon multiparous women would give a better idea as to the effect of the drug. There is a large individual equation in the pain of labor; one will see small women bear large children without showing a sign of pain, while others can be heard for blocks.

Doctor Conrad Georg, Jr.: It is interesting to note how Sahli was led to investigate the action of pantopon. He was looking for a preparation that could be injected hypodermically and still have all the good effects of morphin and the other alkaloids present in opium. He first considered the watery extract of opium and found this to contain a lot of inert substances insoluble or slightly soluble and therefore it could not be used. Then he considered the tincture of opium and found that it contained so much alcohol that it was too irritating to use hypodermically. Then he hit upon this preparation of pantopon because he compared it with the digitalis group. For instance, in digitalis there is a preparation that contains an extract or is supposed to contain an extract of most of the alkaloids of the digitalis series but it was found that it was not as strong as digitopurin. He prepared pantopon by working along these lines. In the use of morphin we have a drug which is always certain in its effect. That it acts somewhat different in different individuals is supposed to be due to a fluctuation in the amount of drug present. In pantopon we have a preparation that contains all the

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alkaloids of the opium series, together with morphin. We know that these alkaloids are numerous, morphin making up about ten-twelfths per cent of opium and the other alkaloids about eighteen per cent. This series of alkaloids was formerly divided between the morphin and the codein groups, the morphin group being supposed to have the narcotizing effect and the other supposed to stimulate somewhat. This was tried out upon animals and although it was proved to be true experimentally, on human beings it has not always proved so in actual practice. Codein has been used wherever one wishes to get the effect of morphin without the nausea. After preparing pantopon it was found that it could be used where morphin was indicated and still not have the bad effects of morphin, for instance, in the postoperative treatment of laparotomy cases and in obstetrics. It occurred to me that we might use it in primiparæ where the cervix fails to dilate, the patient being in labor for hours and still presenting a rigid condition of the muscles. The injection of morphin at such a time by giving the patient a rest, will frequently bring about dilatation; there will be a short sleep and after that the pains will have more of a dilating character. It seems to me that when the propulsive pains come before dilatation pantopon would be good, for it has a sedative action without any of the bad after effects. In internal medicine there are numerous conditions that have not been mentioned; diarrhea can be cured by its use without any bad effects. In cases of carcinoma accompanied by pain, it relieves the pain without producing nausea. But there are numerous other conditions, for instance, local anesthesia. Undoubtedly we could do more operations under local anesthesia if we make use of this drug. I think the dangers of the general anesthetic should be considered and many of the operations done now under general anesthesia could be done by means of a hypodermic injection of pantopon and a local anesthetic, Schleich's solution. In this way the dangers of prolonged anesthesia and the bad effect on the heart and kidneys would be avoided, particularly where ether and chloroform are contraindicated.

Doctor Reuben Peterson: We have not used pantopon, scopolamin or any similar drugs in our obstetric clinic. Personally I have been in rather a skeptical frame of mind about the use of drugs to mitigate labor pains. I have seen more than one drug or method used to lessen the pains of labor highly praised and then discarded as worthless or dangerous. For example, spinal anesthesia, the injection of cocain into the spinal canal, was all the rage at one time. So much so that private patients asked you if it could not be used in their cases. Yet I doubt whether many use this method today after its disadvantages and even dangerous after effects have been set forth. Then came scopolamin, hyocin, morphin and now pantopon. Just because I am skeptical does not mean that this latest arrival should not be carefully tried out, especially if this trial be made in a scientific manner, as Doctor Morley seems to have done.

Morphin is distinctly advantageous in obstetrics under certain con-

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ditions, as for example, when the patient has been in labor a long time and has not accomplished much. Under these circumstances I have found a quarter grain of morphin to work wonderfully well. The woman gets some rest, possibly some sleep and after awhile the uterus regains its vigor and the labor progresses favorably. Yet morphin does have a deleterious effect upon the child, may nauseate the mother and I believe has a tendency to predispose to postpartum hemorrhage.

We must not forget that it is far from a simple matter to estimate the value of any narcotic as a mitigator of labor pains. Pain after all is a relative affair. We usually judge its extent by the amount of fuss the patient makes during the pain. One woman will have much pain if measured by this standard yet who can say another woman does not suffer just as much because she is able to grit her teeth and make no outcry. That is why it would be well to try the effect upon multiparæ as well as primiparæ. In the former there would be data to judge if the labor were better from the use of this drug. Even here we must remember that pain is, as a rule, less in multiparæ than in primiparæ. Nevertheless I do believe that the action of this new drug upon lying-in women should be studied with care and we will look forward with much interest to the future reports of the essayist.

Doctor Morley (closing): The hypnotics, such as hyoscin, morphin and cactin, referred to by Doctor Cummings, have been used in obstetrics but I have had little or no experience with them. Those who have used the so-called "H. M. C." tablet report that its use is often followed by severe hemorrhage. I think that one of the greatest dangers in using any of these hypnotics in combination in the same tablet is that when they are so used and for some reason you wish to repeat the dose, all the component parts must be administered. The bad after effects come from too large doses of morphin or pantopon rather than from the other drugs. It is better to have the morphin, scopolamin, pantopon, et cetera, in separate tablets. Then when you wish to repeat the dose, you can use them separately as they are indicated.

In regard to the asphyxia following the use of pantopon in the cases I observed, I saw no bad results. In one thousand cases of morphin-scopolamin anesthesia or the so-called "twilight sleep" reported by Gauss, the per cent of asphyxia was sixteen. This was due to the morphin rather than the scopolamin. All my cases were primiparæ. It would be interesting to use pantopon on multiparæ where it had not been used in the previous labors and find out if there is any difference in the sensitiveness to the pains.

Chloroform may always be used when necessary after pantopon has been given. In my private practice I am very partial to the use of chloroform and it has never seemed to do any harm when properly given. I start the chloroform early in the labor if necessary but do not use much and later in the labor call in a good anesthetist to administer the chloroform while I look after the delivery. I have never seen any bad effects when given in this way.

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Doctor Peterson asked about the effect of pantopon during the second stage. The authors quoted used it as a rule during the first stage of labor and the effects lasted through the second stage, that is, where they used pantopon alone. If you will remember in the résumé of the cases reported in the literature, a majority of the investigators used pantopon alone in only a few cases and then abandoned it or gave it in combination with scopolamin. I think they gave pantopon too early in the labor and its effects wore off before it had a chance to do much good. I hope to try another series of cases where it will be used in the first stage, perhaps in divided doses. The question of suggestion cannot be ruled out in every case as there is no accurate way to measure the sensitiveness of the contractions.

In regard to Doctor Kamperman's statement about the bad effects of morphin and opium, the latter especially, I think they are due to the inert matter found in the opium and why these bad effects should not follow the use of pantopon may be due to the fact that pantopon is a pure form of opium.

I cannot answer Doctor Canfield's question about the use of pantopon in local anesthesia for I have never seen it thus used nor have I run across any mention of such use in the literature. I do not think it would do any harm. I do not see any harm in trying it in local anesthesia. Its use as a substitute for morphin in surgical anesthesia seems to work very well and if there is any future for pantopon it will be in surgical anesthesia.

My conclusions of the results of pantopon in controlling the pains of labor must needs be tentative until I have had a chance to try it on other cases. Doctor Georg's questions I can only answer by referring him to the cases reported in the literature. Most of the authors say that pantopon used in connection with scopolamin gives better results than pantopon used alone.

TWO CASES OF PREMATURE SEPARATION OF THE PLACENTA.

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ANTEPARTUM and intrapartum hemorrhage, with the exception of that coming from lacerations of the gentital tract, is due to either partial or complete separation of the placenta from its attachment to the uterine wall. Such a complication is liable to be serious, due to the fact that the uterus containing the fetus cannot contract sufficiently to close the uterine sinuses and stop the bleeding. The complication is inevitable during labor when the placenta is abnormally implanted in the lower uterine segment, as in placenta previa, but it occasionally occurs when the placenta is normally situated in the fundus.

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Much diversity of opinion exists as to the etiology of the separation of a normally implanted placenta. In about one-half of the cases there is a history of traumatism. Many believe that an endometritis, either inflammatory or noninflammatory is a causative factor. During labor, separation of the placenta may be due to traction on an abnormally short cord or to the sudden diminution of pressure from the rapid expulsion of a large amount of amniotic fluid in hydramnios or to the birth of the first child in multiple pregnancy. Premature separation usually occurs during the latter months of pregnancy or during the first stage of labor.

The bleeding may be one of two types, either external or concealed. Fortunately the concealed type is more rare, as in fully two-thirds of the cases the bleeding finds its way to the outside. Concealed hemorrhage occurs when the placenta becomes loosened in the center, its margins remaining attached, giving rise to a retroplacental hematoma; also with partial or even complete detachment, if the membranes remain adherent to the uterine wall, and finally when the presenting part acts as a tampon to the lower uterine segment.

The following cases are examples of the external type of hemorrhage:

Case I.—Mrs. A., married, multipara, aged thirty-eight, was admitted to the Maternity Clinic, November 9, 1911. The patient enters the hospital because of bleeding. Her family history is negative. She has always enjoyed the best of health until seven years ago when a tremor of her hands appeared, gradually increasing until it became impossible for her to feed herself. Very soon the tremor affected her arms, head, and whole body. She became incapacitated for all her usual work, could not walk unaided and had to be fed by her family. About two years ago she experienced difficulty in talking which increased to such an extent that at times she could not be understood.

Puberty was established at the age of fourteen. Her periods are regular, of the twenty-eight day type, lasting three days and necessitating about two napkins. There is no pain. The leucorrheal history is negative.

This pregnancy is the patient's fifth. She has two children, aged sixteen and thirteen. About ten years ago she had two miscarriages each at about the fifth month. Her recoveries were uneventful. The date of her last menstruation was March 25, 1911, and the estimated date of her probable confinement, January 1, 1912.

Fetal movements were first felt August 1. There are no symptoms indicative of a toxemia. The first hemorrhage was on August 24 and lasted for three days and four to six pads were soaked daily. There was no pain. During September and October she had two similar hemorrhages. On November 5 she flowed profusely and had some pain similar to labor pains. There was some bleeding when she was admitted to the hospital on the 9th but it was not severe. Her pulse was good in spite of a moderate anemia.

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Vaginal examination by Doctor Peterson showed that one finger could easily be inserted into the os but no placenta could be palpated. The probable diagnosis of premature separation of a normally implanted placenta was made, and it was deemed best to follow out an expectant line of treatment. The patient was kept very quiet in bed and the bleeding ceased. A diagnosis of multiple sclerosis was returned by the Neurologic department.

During the third night of her stay in the hospital the bleeding recurred and soon became profuse enough to soak a large pad in one hour. This persisted throughout the next day. It was then thought unsafe to allow the patient to go longer without emptying the uterus.

Examination under ether showed the cervix sufficiently dilated to admit two fingers. A dark bloody discharge came from the vagina. The membranes were intact and the fetus was presenting by the breech. Normal dilatation according to the Harris method was then done by Doctor Peterson. After dilatation the hand was introduced through the cervix but the placenta could not be felt. After rupturing the membranes a version was performed and the child easily delivered. The placenta immediately appeared at the vulva together with many old clots. About two-thirds of the placenta was infarcted and had no attachment. The child weighed four pounds and was a premature infant of about seven months.

When the patient was returned to her room the pulse was 150 and she was badly shocked. She was given hypodermoclysis and strychnin and reacted so well that within an hour her pulse was down to 86.

Four hours after the operation the patient cried out that she could not get her breath and wanted to be fanned. Her pulse was very weak and rapid and was soon lost at the radial. The respiration became shallow and developed into typical air-hunger. Her lips, nose, and hands became cyanotic. All treatment, including inhalations of oxygen was ineffective and she expired thirty minutes from the onset of the attack.

The clinical picture was one of pulmonary embolism, which was undoubtedly the cause of her sudden death. The husband refused a necropsy. The pathologic diagnosis of the placenta was extreme infarction thrombosis, excessive sclerosis, and areas of inflammation. The condition may be explained by a primary syphilis with secondary pyogenic infection.

Case II.—Mrs. B., aged thirty-eight, married, multipara, was admitted to the Gynecologic service January 6, 1912. Her family and personal history are negative. Menstruation began at the age of fourteen. Menses are regular, of the twenty-eight day type, and of three days duration, using about six napkins. She has no pain. The leucorrheal history is negative. She was married at the age of twenty and has had five children, four of whom are living, one dying in infancy. The last labor, two years ago, was instrumental. Her puerperia were uncomplicated. The patient enters the hospital because of bleeding.

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The date of her last menstruation was September 9, 1911; it was normal in every way, lasting five days. Beginning October 9, 1911, she flowed scantily over two days. The estimated date of her probable confinement is June 16, 1912. Throughout October she had severe morning sickness. During the night of December 26, 1911, she was awakened because of severe bleeding. The blood was bright red but she had no pain. The bleeding continued to be profuse, necessitating six or eight napkins daily and she was confined to her bed because of weakness. From the outset of the bleeding she noticed her abdomen grew larger. The patient when admitted was bleeding profusely. Hemoglobin was eighty per cent with Miescher's apparatus.

Examination of the breasts showed colostrum to be present with moderate darking of the areolæ. Montgomery's follicles were prominent. Abdominal examination showed a swelling from the pubes to the umbilicus. Upon palpation the mass is smooth, hard, and very tender. It rises upward to within one finger's breadth of the umbilicus. Vaginal examination shows no blueness of the anterior vaginal wall. The cervix is softened and extensively lacerated. A diagnosis of pregnancy with a probable premature separation of the placenta was made. It was thought unsafe to allow the pregnancy to continue. The cervical canal and vagina were packed with gauze as a means of inducing labor. The method was unsuccessful and vaginal Cesarean section was decided upon which was performed January 9, 1912. A fetus, eighteen centimetres in length was removed. The uterine cavity was filled with many large old blood clots and the placenta was partially separated from its attachment to the anterior wall of the fundus. The patient made an uninterrupted recovery.

REPORTS OF CASES.

TWO CASES OF POISONING: ONE FROM CAMPHOR, THE OTHER FROM KEROSENE.

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CAMPHOR is an exceedingly common household remedy, yet people in general and even physicians have no adequate idea of its toxic possibilities. At least five fatal cases and a considerable number of nonfatal cases would surely warrant every physician in becoming acquainted with the potential dangers of this drug. Sollman summarizes its pharmacologic actions as follows: (1) Stimulation of the central nervous system, followed by paralysis in large doses. The main action in mammals is on the vasomotor center. (2) Stimulation of the cardiac muscle. (3) Locally, stimulation and paralysis of the sensory nerve endings; also stimulation of the nerves conveying the sensation of cold in the case of menthol. (4) Peripheral depression of the tonus blood-vessels. (5) Mildly antiseptic after the manner of essential oils. (6) A curare action on striped muscle.

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Peterson and Haines give the following description of the toxicology of camphor: "Camphor acts as a powerful stimulant and then as a depressant to the central nervous system. The first symptoms are usually a burning sensation in throat and stomach, vomiting, thirst, blurred vision, roaring in the ears, dizziness and headache. These symptoms are followed in from ten minutes to several hours by convulsive attacks especially in children; these may be mild or very severe and similar to those of epilepsy. Delirium and unconsciousness may follow; if the patient recovers he often remains in a dazed condition for some time. Other symptoms are abnormal sensations of various kinds, dilation of the pupils; symptoms of enteritis and irritation of the kidneys as shown by strangury, albuminuria, or anuria, cold perspiration, cyanosis and a fall or sometimes a rise in temperature. The pulse is irregular, the breath and urine smell of camphor. Nausea, faintness and loss of appetite may continue for several days."

From the foregoing statements it would seem no more than due precaution to label preparations of camphor as poisonous, when dispensing them to the public. Study of the reports of seventeen cases makes it apparent that the effects of camphor are often disproportionate to the dose taken. Fifteen or twenty grains have produced alarming symptoms in an adult and death in a child, yet one hundred fifty and perhaps even two hundred grains have been followed by recovery. In sixteen of the cases convulsions are mentioned as a prominent symptom, in fifteen the pulse was weakened and the rate increased. Cynosis, collapse, delirium, and unconsciousness occurred in nearly all the cases. Of those who recovered all were much better in twenty-four hours and disturbance lasting more than a week is not mentioned.

December 14, 1909, Mrs. F., aged forty-five, through a mistake took four drachms of camphorated oil, containing about fifty grains of camphor, in place of castor oil. She suspected nothing wrong until one and one-half hours later when she suddenly experienced severe pain in the head, and vertigo with weakness in the legs so great that it was difficult for her to get to a couch. At this time she was conscious of disturbed heart action, feeling of pressure in the head, coldness in the extremities, and but a slight burning in the stomach. No physician being available, emesis by mustard water was induced about two hours after taking the drug, but little oil was recovered; camphor odor was present in the vomitus. At this time a physician arrived and administered stimulating medicines.

I first saw the patient the afternoon of December 19, five days after taking the drug. I found her very much depressed mentally, nervous and apprehensive, mouth and skin dry, tongue thickly coated, finger tips and lips slightly cyanotic, skin pale and superficial veins apparently empty. Temperature 97.5°, pulse 140 to 160—small and soft, quite irregular. Heart not enlarged, impulse somewhat exaggerated, second sound relatively loud at both base and apex. Respiration forty to sixty, shallow and often sighing. No abnormal physical signs in chest.

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Abdomen retraced, tendon reflexes normal, hands, feet, and legs cold. Blood examination showed: Hemoglobin 100—Talqvuist; red blood cells 6,000,000; white blood cells 5,400. Differential count showed nothing abnormal. Urine, twenty-four hours, ten ounces, light color, clear; specific gravity, 1009; sugar, albumin and casts absent. Bowels acted sluggishly; passages showed much undigested food and very little bile.

Patient complained of heat and pain in head and back of neck, dimness of vision, a feeling of compression in abdomen and chest, cold hands and feet with numbness of fingers and toes. Strychnin and digitalis had given no relief of symptoms or improvement of heart action, so were now discontinued. Ice was applied over the heart and at back of neck and mustard packs alternating with dry heat were applied to feet and legs. Sparteine sulphate, grain one-eighth, was given every two hours. Peptonized milk and a very soft diet allowed. This treatment seemed to give comfort promptly and after twelve hours her pulse was 80—stronger and more regular; respiration 24 and more natural. For several weeks attacks of tachycardia would come on frequently without apparent cause, accompanied by mental depression so marked that patient would be afraid to go to sleep. The ninth day after taking the drug secretion of saliva and urine abruptly increased and perspiration was noticed. The urine rose to forty ounces; specific gravity 1016. Digestion also begun to improve at this time, the stools becoming much darker in color. With this increase of secretions, menstruation, which had been absent for several months, appeared and has recurred every two weeks, sometimes being accompanied by an exacerbation of the heart symptoms.

This dose of camphor being in oil produced severe general symptoms with but little local effect, the central nervous system and vasomotor center seeming to suffer most of the injury. For several weeks the blood pressure conditions were in some measure similar to those present in shock. Rest, time and general tonic treatment gradually restored the patient to her usual health.

* * *

October 19, 1911, Clifford L., a sturdy boy of twenty months swallowed four or five drachms of kerosene. He was quite severely strangled for two or three minutes afterward. When I saw him about forty minutes later he was so stupid that he would go to sleep while being briskly walked about, pupils were widely dilated and face pale. As a draft of mustard water had failed to produce emesis I quickly washed the stomach with warm water until the odor of kerosene had practically disappeared—about six quarts were required. A half ounce of milk of magnesia was given, also an enema. At this time the pulse was about 150 and regular but feeble. Temperature 98°, respiration 36. The child seemed to feel much better after an hour and continued so until about 4 P. M., when he became flushed and complained of severe pain in the abdomen. At this time an enema produced a good passage

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which gave a distinct odor of kerosene. The abdomen was now moderately distended. Temperature 103°, pulse 180, respiration 60—with an expiratory grunt very like that of pneumonia. Child constantly in severe pain with periods of great agony, nauseated, cannot retain much water although very thirsty. Large dose of bismuth seemed to relieve the pain considerably but codein, grain one-eighth, had to be given two or three times each twenty-four hours for a week to obtain even a moderate amount of sleep. The fever, rapid heart and breathing, begun to improve about the sixth day and after ten days the child was able to be about and to digest his usual diet without pain. In ten days he lost about six and one-half pounds in weight.

DEMONSTRATION OF APPARATUS

STEREOSCOPIC PLATES OF DIFFERENT PARTS OF THE BODY.

WALTER R PARKER, M. D.
Department of Ophthalmology.

THE apparatus I wish to demonstrate tonight is a stereopticon for use in *x*-ray work. While the apparatus would not be used frequently by any clinic it seems to me that all of us would use it enough to warrant adding it to our equipment.

Through the kindness of Doctor Preston M. Hickey, of Detroit, I am able to show several excellent stereopticon plates of different parts of the body. No explanation is necessary, although I should like to call your attention particularly to one plate of a skull which shows the absence of the posterior horn of the sella turcica in the case of a tumor at the base of the brain.

DISCUSSION.

DOCTOR JAMES G. VAN ZWALUWENBURG: My experience with the stereopticon apparatus is rather limited. Some years ago an attempt was made to use the method in our clinic. Since the plates were always adjusted for my observation, I cannot say that I know a great deal about their proper position for observation. The apparatus used consisted of two heavy prisms and it took considerable skill to get a proper superposition of the images. Some curious things come out in the stereogram of this kind, if improperly observed.

The method of course is very valuable for the determination of the relative position of an opaque body, but there is always the difficulty that the apparent depth at which an object lies in the tissues, depends upon the relative position of the plate and the anodes, the distance between the anodes and the two positions, and the intraocular distance in the observer. The visual parallel is so narrow that any slight variation produces a relatively enormous distance in the apparent depth of the image.

Practically the use of the stereogram is limited to the observations of small parts. It gives a very comprehensive impression of the locali-

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zation of small fragments in a fracture without the necessity of taking extra plates. In eye work I imagine it would be of great value in the localization of foreign bodies.

Its use in connection with internal medicine and thoracic disease in general has always been very disappointing for several reasons. In order to get a perfect stereogram there must be absolutely no motion of the object radiographed between the taking of the two plates because slight movement will introduce relatively large errors in the image as observed by binocular vision. This is almost impossible because of the constant motion of the heart and great vessels and because of the difficulty in restraining the movements of the diaphragm. It is scarcely possible for a patient to hold his breath three seconds for one exposure and after taking a breath to assume the same position as before.

Many ingenious devices are on the market to facilitate the taking of two plates while the patient holds his breath. Even this will not eliminate the cardiovascular movements.

After all, there are not many ways in which it could be applied by the internist. Signs of tuberculosis are no more marked and are often confused in the stereogram and there is always the possibility of an error introduced by movement. After all, the important question is whether there is a cavity rather than where it is located. In aneurism one has to do with a moving body which it is impossible to fix, so that at best our images are more or less blurred and lacking in definition. With a fluoroscope one can easily obtain the impression of the third dimension by rotation of the patient before the screen and here the definition is satisfactory in every position.

In spite of the great amount of work which has been done and the length of time the radiogram has been used, it has never found much favor with internists. Possibly sometime someone will devise a method by which two plates can be taken simultaneously, although this seems extremely improbable at present. Until then internists will prefer other forms of *x*-ray procedure.

Doctor Parker (closing): Replying to Doctor Hewlett's question concerning the use of the stereoscope in the location of foreign bodies in the globe, as far as I know it would be of no use whatever in this class of cases, the Sewet's localizer being used for this purpose. In fact, it would be of very little use in my clinic, except in these rare cases of tumors involving the sella turcica which so often show eye symptoms. In regard to the use of the apparatus in internal medicine, Doctor Van Zwaluwenburg knows more about that than I do. The long exposures, however, are being overcome. I saw a good plate showing the abdominal structures which had been exposed but one-fifth of a second. While the apparatus would not be of daily use to any of us, it would be occasionally, and it seems to me we cannot be without it. The apparatus is here on approval and can be returned without expense. if the heads of the several clinics are not interested.

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TRANSACTIONS
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STATED MEETING, MARCH 6, 1912.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.
REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS.

A CASE OF BILATERAL EXTRAUTERINE PREGNANCY.

REUBEN PETERSON, A. B., M. D.
PROFESSOR OF OBSTETRICS AND GYNECOLOGY IN THE UNIVERSITY OF MICHIGAN.
ANN ARBOR, MICHIGAN.

I DESIRE to give a brief synopsis of a very remarkable case of bilateral tubal pregnancy leaving for a future paper a more detailed description of the case and a review of the literature of similar cases.

Mrs. L. L., Gynecologic number 4304, aged thirty, married, was admitted to the clinic, January 25, 1912. The patient enters the hospital for attacks of pain in the lower right abdominal quadrant which have existed since January 19, when she was seized with a sudden pain just after she had gone to bed. She had skipped the December period but did not consider herself pregnant. In October, 1910, the patient had the first attack of this description just after she had got up in the morning. At this time she had quite frequent attacks of abdominal pain and tenderness and was confined to the bed a number of days during some of the attacks. The attacks lasted for about two months and she had been comparatively free from pain until the present attack.

Examination shows a rather full, but soft abdomen with tenderness above the pubes. The pelvis is the seat of a tumor which fills the culdesac and is clearly outlined. It is hard, tender and only slightly movable. It can be easily distinguished from the uterus, which is somewhat raised upwards by the pressure of the mass behind. By estimation the mass is about the size of a cocoanut.

The case was carefully analyzed in the clinic and a probable diagnosis made of extrauterine pregnancy with recent rupture. The

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mass in the pelvis was thought to be an ovarian cyst with a twisted pedicle. A median incision revealed fluid blood in the abdominal cavity with a right ruptured ectopic pregnancy about the size of a hen's egg. As the tube was being lifted up there escaped a small fetus about three to four centimeters in length. This tube and ovary were removed. Upon investigation the adherent mass in the posterior pelvis was found to be somewhat oblong and about ten centimeters in

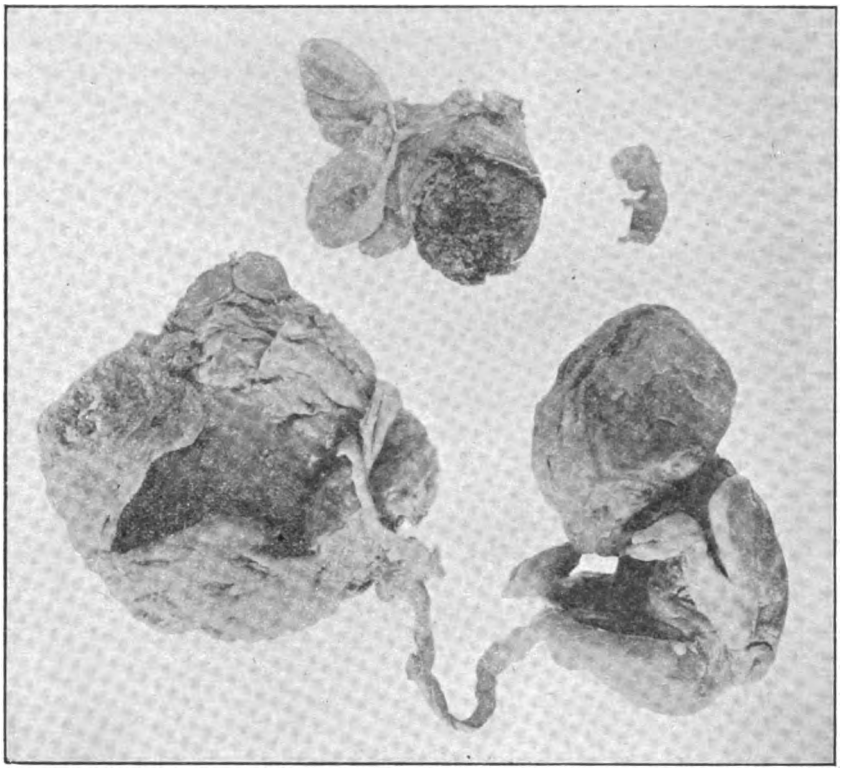

FIGURE I.—Bilateral Ectopic Pregnancy.

diameter. Upon releasing the adhesions and lifting up the mass, the latter ruptured, giving escape to a placenta and a somewhat mummified fetus, probably about a five months gestation. This evidently was an old octopic pregnancy of the left tube. The latter together with the left ovary was removed.

The patient made an uninterrupted recovery.

Questioned after the operation the patient, who had been married but a year, said that she had been exposed to pregnancy many times during the two years previous to her marriage. Evidently the attack in October, 1910, was due to rupture of the ectopic sac. The rupture resulted in the death of the fetus with a gradually shrinking of sac and exudate.

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As Smith has pointed out in his excellent monograph on repeated extrauterine pregnancy, it is not so very uncommon for both tubes to be effected at different periods of time. However, it is certainly unique to find evidence of an old ectopic on one side with a more recent ruptured ectopic on the other.

DISCUSSION.

DOCTOR GEORGE KAMPERMAN: Probably no gynecologic condition is so interesting as extrauterine pregnancy, and there probably is no other condition where one is so likely to slip up on the diagnosis. Hunner from Johns Hopkins reports that in their clinic the first of a series of ectopic gestations usually goes undiagnosed until the abdomen is opened. After that they are on the alert and then the diagnosis is not so difficult. Grandin considers that the only way to diagnose this condition is to assume that every patient coming for gynecologic treatment may have an extrauterine pregnancy. In this way one would be sure to rule out the condition.

Doctor Richard Smith has raised the question as to what should be done with the opposite tube. He considers that another ectopic pregnancy is very likely to follow, and a normal pregnancy very unlikely. For this reason he advises the removal of both tubes. That is not the method followed in this clinic. Repeated ectopic gestation is so rare that it would hardly seem necessary to rob the patient of her only hope of maternity in order to insure against a recurrence.

DOCTOR CYRENUS G. DARLING: I have had little experience with extrauterine pregnancy, but what experience I have had also goes to show that such cases seem to come in groups. For instance, one day I had two cases, one was thought to be appendicitis, but the other was rightly diagnosed.

DOCTOR REUBEN PETERSON (closing): In spite of the conclusion of Smith that the opposite tube should be excised when an ectopic pregnancy is removed, I would hesitate to make this rule universal, for the reason that it is by no means always the case that in subsequent pregnancies ectopic gestation will result. The wishes of the patient must be taken into consideration, especially if she has had more than one extrauterine pregnancy. One of my patients had three attacks, twice in one tube and once in the other. Twice she escaped operation, and once I removed the right tube. In a case like this, it would be perfectly justifiable to accede to the woman's wishes and remove the opposite tube.

REPORTS OF CASES.

AN UNUSUAL HERNIA FOUND WHILE OPERATING FOR APPENDICITIS.

CYRENUS G. DARLING, M. D.
Department of Surgery.

MR. A, a young man twenty-two years of age, entered the University Hospital with a history of two attacks of appendicitis. He had just recovered from the last attack and came for an interval operation. An

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incision about three inches long was made through the right rectus muscle through which the ascending colon was drawn. It was noticed that the mesocolon of this part of the gut was very long. It was so long, in fact, that the whole of the ascending and part of the transverse colon was easily delivered through the incision. In the mesentery of the ascending colon was a mass of material of a shade darker color than the surrounding tissue, soft and movable, which could be seen alike from both sides of the mesentery. The appendix was still inflamed and had a cicatrix not unlike that found in stomach ulcer. The appendix was removed in the usual way and attention was again turned to the mass in the mesocolon. Following this down to the median line, the small intestine was encountered. This intestine was entirely empty and a portion of it was found passing into an opening on the posterior wall of the abdomen. Traction was made on this and several feet of the intestine were drawn out of the opening and the tumor mass in the mesentery entirely disappeared. The opening was examined and found to extend from the vertebræ to the right about three inches from the pelvic border. The opening readily admitted two fingers and the whole pouch was lined with peritoneum. As I had just operated for an inflammatory condition of the appendix I did not think it wise to attempt any operation upon the hernia, especially as there had been no symptoms from it. Careful inquiry failed to recall the slightest symptom that could point to any trouble from a concealed hernia.

DISCUSSION.

Doctor Matthew Kollig: The hernia just described is one of unusual type and very interesting both from a clinical and anatomical standpoint, whether it be due to arrested development, or is purely an acquired condition, or a combination of both. Many unusual forms of intraabdominal hernias have been recorded in the literature by various observers, especially Doctor Alexander H. Ferguson, in his book "Modern Operations for Hernia," such as retroperitoneal hernias; hernias of the left mesocolon situated on the left side of the descending colon; hernias between the folds of the transverse mesocolon into the lesser sac; also ileocolic, ileocecal and various other types, but none have I been able to find exactly similar to the one just described by Doctor Darling.

From the data given, one is not able to state positively as to the type, but I would think of the possibilities of a hernia passing behind the spermatic artery and vein where no doubt the vein was enlarged, thereby giving more opportunity for a sac of peritoneum to be pushed behind the artery and vein in the direction described by the author. The probability of such an explanation was called to my attention in the anatomical laboratory, where we found a poorly developed iliacus muscle, and an unusually tense lateral femoral cutaneous nerve which supported the peritoneum and iliac fascia in the manner of a ridge-pole of a tent, allowing the hernial sac to be pushed behind and below the nerve, that is, between the nerve and iliacus muscle.

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DOCTOR JOHN H. PETTIS: To my mind this case illustrates more than anything else the great importance of making every abdominal operation exploratory unless of course in the presence of some contra-indication such as pus. This young man came to the surgical clinic with a diagnosis of chronic appendicitis and the findings at operation showed that this diagnosis was correct. Had we not suspected other trouble in the abdomen and gone through the "gridiron" incision it is more than likely that the pathology which Doctor Darling has described would not have been detected. I believe that the danger of hernia which we are told is liable to follow when large incisions are made is more than counterbalanced by the danger of leaving undetected pathologic conditions when we operate through incisions too small to allow a thorough exploration of the entire abdominal cavity.

DOCTOR DARLING (closing): The kind of incision employed is not so important in the male as in the female. In the female, the differential diagnosis between disease of the ovary and tube and appendicitis is often so difficult that it is advisable to make an incision through which the ovary and tube, as well as the appendix, can be examined. For this reason, in the female, I usually make the incision in the right rectus muscle rather than McBurney's incision. If there is a question of gall-bladder trouble, the longitudinal incision is also used.

A CASE OF PAROTITIS COMPLICATING TYPHOID FEVER.

HARRY B. SCHMIDT, M. D.
Department of Internal Medicine.

W. F., laborer, aged thirty-eight, was admitted to the University Hospital as an "emergency," February 24, 1912.

His family and personal histories are negative. Patient has been sick since February 9, with fever, headache, and griping pains in the abdomen. Examination shows a poorly nourished man, one hundred six pounds, listless and drowsy. Tongue is heavily coated and dry. Temperature 100.4°, pulse 78, respiration 20. The pulse is full, soft and dicrotic. Lungs and heart negative. Abdomen below the rib level, covered by numerous typical rose spots. Spleen palpable. Whites 7000. Widal positive, one-fortieth dilution in fifteen minutes. Since entering the hospital, the temperature has been very irregular, running as high as 102.5° in the afternoon with remissions in the morning to 95.4°, with cold sweats. On February 24, the temperature fell to normal and remained so until the morning of the 28th, when it rapidly rose to 102.4° in the afternoon.

On the evening before, patient had complained of a tender swelling, about the size of an English walnut beneath the sternocleidomastoid muscle, below the angle of the jaw. On the 28th, this swelling had extended until it involved almost one-half of the left side of the face, from the zygoma down to midway between the angle of the jaw and the clavicle to one inch behind the ear. The skin was very tense, but slightly reddened, mass tender, no fluctuation. The patient ran a

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continuous temperature from 100° to 102.4° for four days when the temperature became flat once more, the swelling began to subside until it entirely disappeared. At no time was there any evidence of suppuration. At present the patient is making an uneventful recovery.

DISCUSSION.

DOCTOR ALBION WALTER HEWLETT: Parotitis is a rather uncommon complication of typhoid fever. Prognosis in cases showing this complication is rather unfavorable, partly on account of the complication indicating a general lack of resistance on the part of the patient. At one time we thought that surgical intervention would be necessary, but the inflammation resolved without this.

DOCTOR CYRENUS G. DARLING: This is the first case of parotitis complicating typhoid fever I have ever seen, and as it was pursuing an uneventful course, we thought it best not to operate. The reason why some cases prove fatal is that the incision is not large enough. Parotitis of the infected type may lead to the formation of pockets in various parts, so if one waits for fluctuation in these cases, one is apt to wait too long, and pus forms and spreads to other parts of the gland. If one is going to incise the gland, one must depend on the temperature and upon the general symptoms of the infection and not on signs alone.

DOCTOR REUBEN PETERSON: Parotitis is seen occasionally after abdominal operations and is usually due to sepsis. However, it sometimes appears after operations on the female genitalia where there has been little or no clinical evidence of sepsis. For this reason, Doctor William H. Morley, of Detroit, when an assistant in the University Gynecologic clinic, after thoroughly investigating a number of cases which had occurred in this clinic came to the conclusion that some cases at least were of neurotic origin. From my experience with parotitis complicating abdominal operations, there is great swelling, but little tendency to suppuration. I remember one case in the early nineties, when extraperitoneal treatment of the stump was in vogue in hysterectomies for fibroids, where there was enormous swelling of the left parotid with high fever and delirium. An extensive incision in the neck failed to reveal any pus and the patient eventually recovered. In this case the parotitis was undoubtedly due to sepsis from sloughing of the stump. As a rule early operation is advisable if there be accompanying high fever and signs of marked sepsis. Otherwise, a waiting policy is advisable, as many of these parotid swellings resolve without pus.

A CASE OF STRYCHNIN POISONING.

ALBION WALTER HEWLETT, M. D.
Department of Medicine.

J. B., a patient with lymphatic leukemia, and weighing one hundred ninety pounds stripped, took by mistake fifteen grains of strychnin sulphate, divided in three capsules. This dose was taken at 8:15 A. M.

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An hour later I was sent for and found the patient rigidly extended on the bed and within ten or fifteen minutes he had a severe general convulsion. A diagnosis of strychnin poisoning was then made and the stomach was washed out repeatedly. However, the patient had another severe convulsion and numerous milder ones up to 1 o'clock in the afternoon. He was under continual anesthesia, first with chloroform and later with ether, from 9:45 A. M., to about 4:00 P. M. Recovery was complete.

Analysis of the first stomach washing showed that this contained four and one-half grains of strychnin. Over one and one-half grains of strychnin were recovered from the urine, mostly within twenty-four hours. Very little was excreted during the most active stages of the poisoning. Traces were present in the urine for three or four days. The temperature, which was taken from 1:30 P. M. on, showed a continuous elevation for about twenty-four hours, the highest being 102° Fahrenheit.

DISCUSSION.

DOCTOR VICTOR C. VAUGHAN: This was a very interesting case, and I wish to emphasize a few points. This man's recovery was due to the prompt and efficient treatment given him by Doctor Hewlett, and this should prove a very striking lesson to all students. When we find a man with symptoms of strychnin poisoning we should not temporize, but should proceed immediately to wash out the stomach. Some time ago a good doctor was placed in an embarrassing situation. He was called to see a man who had convulsions, but at the moment the doctor called he was quiet. The doctor perceived the odor of alcohol, and knew that the man was an occasional drinker. The doctor went away, and said that he would call again, but before he did so the man was dead.

The second point of interest is that of the elimination of strychnin in the urine. In this case I was surprised to find the amount so small in the first excretion. The method which I employed in determining the amount of strychnin in this case, is that ordinarily used in medicolegal investigation. One hundred cubic centimeters of the urine was evaporated to dryness, and the residue taken up with absolute alcohol. The alcoholic solution after filtration was again evaporated to dryness and charred for half an hour with sulphuric acid. The charred residue was then extracted with ice-cold water and made alkaline with ammonia, and shaken out with chloroform. This was repeated, and the combined chloroform extracts evaporated to dryness and again charred with sulphuric acid, again taken up with water, rendered alkaline, and again shaken out with chloroform. The final chloroform extracts were evaporated to dryness in weighed watch glasses and weighed. I have repeatedly tested this method, and have found that when I have added strychnin directly to the urine, I have been able by this method to recover from eighty-eight to ninety per cent of that added. The total amount of strychnin which I obtained

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from the urine in this case is large, but not an impossible amount. I have generally stated in medicolegal investigations that the minimum fatal dose of strychnin is one-half grain. Some authorities place the fatal amount at a much larger quantity.

The third point of interest, is the influence of strychnin upon the temperature. I have found by experiments upon dogs and rabbits, that poisonous doses of strychnin may elevate the temperature from two to four degrees above the normal. In a recent case tried in Missouri and reviewed by the Supreme Court of that state, that court held that the dead man could not have been poisoned by strychnin because his temperature was above the normal.

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TRANSACTIONS
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STATED MEETING, APRIL 3, 1912.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.
REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS.

TWO CASES OF WARTY TUMOR OF CICATRICES—EPITHELIOMA OF CICATRICES.

CHARLES B. G. DE NANCREDE, A. M., M. D., LL. D.
PROFESSOR OF SURGERY AND CLINICAL SURGERY IN THE UNIVERSITY OF MICHIGAN.
ANN ARBOR, MICHIGAN.

As far back as 1833 this condition was carefully described in a paper in the transactions of the Medico-Chirugical Society by Mr. Caeser Hawkins, one of the most notable men of his time in Great Britain, who first called it "warty tumor of a cicatrix" or "warty ulcer." A warty ulcer occupying the anterior portion of the leg was described by Marjolin, a French surgeon, hence was often named for that surgeon "Marjolin's ulcer." Cases of chronic ulcer on the front of the tibia, if existing for long periods, become sometimes infiltrated with small areas of epithelium, giving rise to false alarms as to the cancerous nature of such ulcers, but the margins remain clinically those of a chronic ulcer, not a breaking-down neoplasm. The not infrequent true epitheliomatous degeneration of chronic granulating surfaces starting in old cicatrices is taught in the books and in lectures, but few believe in its practical occurrence, apparently judging by the number that pass muster.

The first case I saw was forty years ago. It was a typical Marjolin case, but was not very warty. The tibia had become as badly curved as in the ordinary variety of bow-leg from epitheliomatous infiltration of the bone. The limb was amputated by Doctor J. Ashhurst, Junior, and I made a microscopic examination which showed a characteristic epithelial carcinoma deeply invading the bone.

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Furthermore, I am satisfied that a number of cases pass muster, of bone sinuses and ulcerating surfaces around the boundaries of old scars which are constantly breaking down and will not heal. Doctor J. Ashhurst, Junior, operated on a bone case like these but did not recognize the true condition although teaching and writing of such cases; eventually another Philadelphia surgeon amputated the limb when the microscopic examination left no doubt of the malignant nature. As it has been at all times in the past and I suppose will be in the future, the examination of the edges of many of the chronic, so-called indolent ulcers on the front of the leg that do not break down and clinically are nonmalignant, will show some microscopic appearances suggestive of epithelioma, as a few pearly nests. But a widespread infiltration of epithelial cells into the deeper parts and a breaking down of tissues never takes place; they may break down temporarily from accidental circumstances but do not present appearances such as two cases recently in my clinic showed. I will mention the essential points in their histories:

Case I.—The patient, male, forty years of age, cigarmaker, entered the Surgical clinic of the University Hospital, December 4, 1911, because of an ulcerated sore on the right leg.

Family and personal history is unimportant.

His present trouble began at the age of five years, at which time he was severely burned on the right thigh and outer part of the right leg. This remained unhealed for fifteen years, at which time it was grafted and completely healed. From the age of twenty, until he was thirty-three years old he had no trouble with the limb. Seven years ago, that is, at the age of thirty-three, while wrestling, he was thrown on the edge of a barrel striking his left limb over the old cicatrix. Soon after this accident the patient noticed small hard lumps scattered over the old scar tissue. These lumps which seemed to be beneath the skin, ulcerated and the ulcers increased at the edges until the present time, when the entire outer aspect of the right limb is involved.

His physical examination is practically negative.

A piece of the ulcerating area was removed and sent to the Pathologic Laboratory, and the following report returned: "Squamous-cell carcinoma, far advanced. Deeply infiltrating subcutaneously."

Hip-joint amputation was done by Doctor de Nancrède.

The patient made a very slow but uneventful recovery following the operation.

* * *

Case II.—Mr. G., a farmer, sixty-four years of age, entered the Surgical clinic of the University Hospital, February 27, 1912, because of a growth on an old amputation scar on the left foot.

His family and personal history is negative.

Twenty-nine years ago the patient had both feet amputated from frost bite. These healed without difficulty, and gave him no trouble

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until two years ago when a small bleeding ulcer appeared at the bottom of the scar on the left stump. This ulcer bled profusely, caused him considerable pain of a burning character, and made it impossible for him to use the foot. This condition has gradually gotten worse until at the present time it covers practically the entire area of the amputation stump.

Examination shows a cauliflower-like mass about the size of a half orange occupying the lower anterior portion of the left stump. The mass is not especially tender, bleeds easily, and has a very foul odor. There is some enlargement of the left inguinal nodes. A piece was excised and sent to the Pathological Laboratory, from which the report of "Squamous-cell carcinoma" was returned. The leg was amputated at the lower third, and the patient made an uneventful recovery.

I asked one man if anybody had ever suggested to him that his case was malignant and he said they had not. He has been in various hospitals in different parts of the country, among them Cook County Hospital, Chicago, and nobody ever suggested to him a malignant condition might be the cause of the leg not healing and the breaking down of an enormous surface which extended from near the knee below, up two inches and covered fully one-half of the postero-external surface of the left thigh.

It struck me at once that it was very doubtful if this was an ordinary granulating surface, and I believed it presented certain characteristics of epithelioma. I made a futile effort to partially cover the ulcer with a pedunculated graft, and a fragment of the growth was at once sent to Doctor Warthin who pronounced it to be a far advanced and deeply infiltrating squamous-celled epithelioma. I did a hip-joint amputation and the patient recovered.

I want to impress upon you what I say about these ulcerating scars. That they become malignant is a well-known fact, but the question is whether there is one in this room who has really taken this fact to heart. I am satisfied that if you subject all suspicious cases to a microscopic examination a certain number of old bone cases with sinuses and much granulation tissue around the skin surfaces of the sinuses will show real epithelioma.

When I see an ulcerating surface that extends and does not heal, I wonder whether it may not be an epithelioma. This case I have just reported should have been operated upon several years ago when it might not have been necessary to do hip-joint amputation.

I remember another case in which a cure of lupus had been effected by the *x*-ray, a normal healing granulating surface resulting. Finally this began to spread a little and get a little deeper and to get very suspicious of warty infiltration. Finally I told the patient, who in this case was a physician, that he had an epithelioma. I had to take away a greater part of the upper lip and part of the face. It proved histologically a carcinoma.

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I took the trouble to look over the reports of the Pathological Society of Philadelphia for the past ten or fifteen years and it was astonishing how many of these cases I found reported. They were usually suspected, and generally proved to be carcinoma after a piece of tissue was taken out for microscopic purposes, but not always before operating.

504 State Street South.

DISCUSSION.

DOCTOR DEAN LOREE: I would like to ask Doctor de Nancrède if many of the recurrences in carcinoma do not come in the scar? I have seen several cases of recurrent carcinoma of the breast with no enlargement of the glands, but returning directly in the scar tissue of the incision.

DOCTOR REUBEN PETERSON: If such long-standing cases of carcinoma, such as described by Doctor de Nancrède where the lymph-nodes are enlarged, can be permanently cured by amputation without removal of the enlarged lymph-nodes, I consider that this fact will have an important bearing upon the technic of the radical abdominal operation for carcinoma of the uterus. For the principal objections to this operation have come from those who contend that it is an operative impossibility to remove all the pelvic glands in carcinoma of the cervix. Hence, they say if all cannot be removed, why remove any? The fallacy of this argument lies in the fact that in only a certain proportion of the cases are the pelvic glands the seat of cancer. This has been proved by the microscopic examination of these glands removed at operation and in the postmortem room where the patient has died from the disease. Wertheim has been able to permanently cure fifty per cent of his operated cases now numbering over five hundred, yet he does not make it a practice to attempt the removal of all the pelvic glands. Hence, it must be concluded that the good results of the radical abdominal operations for cancer of the uterus must depend upon the wide removal of the parametrial tissue and that the failure of other less radical procedures is due to the fact that cancer in this tissue was left behind. So we may say that the disease did not return but simply that it continued to progress.

DOCTOR JOHN H. PETTIS: I examined these patients carefully when they entered the hospital and watched them very closely during their stay. The inguinal glands were considerably enlarged when they came in and it was a question whether or not they were involved in the malignant process. In both cases, however, these glands became rapidly smaller following operation, and had practically disappeared when the patients left the hospital, indicating that the enlargement was due to the absorption of toxic material from the infected areas and not from carcinomatous involvement.

DOCTOR DE NANCRÈDE (closing the discussion): As far as I am

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aware, in the past numerous cases have been reported, where a wide incision resulted in cure at the time of the report. I cannot say how long a time elapsed after the primary operation without recurrence. Again, I remember over forty years ago, going down to Newark, Delaware, to do an operation for an epithelial carcinoma of the lip. At that time we were very chary of meddling with anything but the tissues that were clearly diseased. There was some enlargement beneath the jaw and I hesitated as to whether it was really worth while to operate at all, and then again whether I had better meddle with the mass underneath the chin. I did what we would not do nowadays, I made a free excision of the lip and let the submental mass alone, and I never heard any more of it. It was due to pyogenic glandular enlargement. There is some difference as to whether one has to do with a surface epithelial carcinoma or a glandular carcinoma. In reply to Doctor Loree's question, it is undoubtedly true that there will be recurrence in the scar tissue when this remains intact, after amputation of the breast, but I think it is due to the imperfect removal, rather than to carcinoma arising *de novo* in degenerating scar tissue. You will remember how free are the communications of the blood-vessels through the thoracic wall with the interior of the thorax, and that the perivascular lymph-spaces around these give ready access to the smaller and more readily detached cells found in glandular carcinoma than in epithelial carcinoma. There are glandular carcinomata of the breast that have been operated that never show the slightest recurrence in the thoracic wall, or in the axilla, and have yet had extensive involvement of the lymphatic vessels of the pleura and mediastinal glands arising as I have suggested. However, I do not think it is from new disease originating in scar tissue. Again, in the breast the adenocarcinomata frequently present enlargement of the axillary lymph-nodes, yet there sometimes will be no microscopic evidence of carcinoma in the lymph-nodes removed. In fact, some of these cases will show endotheliomatous change and not carcinomatous change in the lymph-nodes removed.

I saw the statement made the other day that carcinomata of the intestinal tract are extremely rare in the young; indeed almost never known. I disagree with this. They are not so very uncommon under twelve and I have known one of mammary growth at three and one-half years in a female child. It is not impossible to find carcinoma of the intestines and of the rectum, well under twenty years. It is rare, but it is not so extremely uncommon as frequently stated. There are many fallacious statements made about carcinoma. I have seen three cases of carcinoma of the stomach in individuals about twenty, these were microscopically proved postmortem. We talk as if each one of us knew all that was to be known about carcinoma, whereas we really are only just beginning to know a very little *certainly*.

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DIAGNOSIS OF TUBERCULOUS ENDOMETRITIS BY STAINING THE BACILLUS IN SMEARS OBTAINED FROM THE CERVIX.

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TUBERCULOSIS of the female genital organs is a subject which has called forth a vast amount of literature and excellent research. A brief review of some of the earlier work might prove interesting.

In the year 1744, Morgagni in performing an autopsy upon a young woman who had died of tuberculous peritonitis, found the genital organs involved. From his description we learn that the tubes and uterus were filled with a caseous material, and that the ovaries and tubes were bound together by dense adhesions. Following this discovery, several men reported cases, but it was not until after the discovery of the tubercle bacillus by Koch, in 1882, that the question of uterine tuberculosis was carefully considered. Babes stained the tubercle bacillus in the secretions from the vagina, and Hegar, in 1886, published an article on the cause, diagnosis and treatment of this condition.

Two forms of tuberculosis of the uterus have been, and are written about: (1) a primary form, which is considered ascending infection; (2) a secondary form, which is descending in its course. Although these two forms are believed by nearly all the writers upon this subject to occur, some authors deny the possibility of a primary form, while many more believe this form is very rare. Hegar was the originator of the theory of the primary, ascending form, and the secondary descending form. He suggested the following possibilities in the primary form:

(1) Penetration of germs from the outside directly to the mucosa of the vagina, uterus, tubes, peritoneum and ovary.

(2) Penetration of germs through minute breaches of continuity in the genital canal, into the lymphatics, thence to the Fallopian tubes directly, or against the lymph current as we see in the neck occasionally, or by way of the pelvic peritoneum into the tubes at the fimbria.

Kleinhaus gave three arguments in favor of a hematogenous route of infection.

(1) The existence of tuberculosis in the genitals following tuberculosis of the lungs, with no intermediate foci.

(2) The frequent localization of tuberculosis on the site of the placental attachment.

(3) The transmissibility of the bacilli from the mothers to the fetus.

Voigt called attention to the frequent occurrence of genital tuberculosis during the period of sexual activity, thus emphasizing the possibility of direct, ascending infection.

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Murphy and others have noticed the frequency of genital tuberculosis before puberty.

Direct infection may occur from dirty instruments, bed linen and clothing, the physician or patient's fingers and especially from coitus. In favor of the primary form Murphy gave the following reasons: (a) Otherwise strong, healthy people have primary manifestations in the genitalia; (b) After the removal of the local genital focus, patients remain well for years; (c) Children otherwise apparently healthy having primary tuberculosis manifested only in the external genitalia.

In 1883, Cohnheim suggested that coitus might be the cause of tuberculosis in the female genitalia. Since that time the tubercle bacillus has been stained in the urine and seminal fluid of patients with phthisis, without involvment of the genitals; also in cases of tuberculous epididymitis. The possibility of this mode of infection naturally led to a great deal of animal experimentation. Without going into details, some of the results and conclusions were suggestive, if not convincing. Semen from tuberculous patients, without involvment of the testicles, was injected into the peritoneal cavity of guinea-pigs and tuberculosis resulted. This experiment, however, failed in rabbits (Landouzy and Martin).

Male animals were inoculated in the testicles and placed with healthy female animals. Many of the females became tuberculous with lesions in the vagina and uterus (Gaertner).

Popoff concludes from his experiments that—

(1) It is impossible to infect the genital tract unless there is some preceding trauma.

(2) In cases of tuberculosis following traumatism, the lesions remain localized in the genital apparatus and its lymph glands.

Marie Gorvitz, working on eleven rabbits and fifteen guinea-pigs and using pure cultures of tubercle bacilli, concludes: Simple deposit of the bacilli in the vagina without trauma will not give rise to tuberculosis.

Lehman was first to report a case of placental tuberculosis. This gave rise to many theories and some research relative to congenital infections. Hauser and Friedmann collected twenty-two cases of tuberculosis transmitted from the mother to the child. Friedmann also showed that rabbit and guinea-pig embryos could be infected from the paternal side by the spermatozoa carrying the bacillus.

Tuberculous endometritis, the subject of this paper, occurs in several forms, the most common being a miliary tuberculosis of the uterine mucosa. A second form consists of ulcerated areas and caseated masses filling the lumen of the uterus. Associated with the miliary and ulcerative forms there is invariably a catarrhal condition of the cervical glands which is called a bacillary catarrh. Within the last twelve years there have been over thirty cases of tuberculosis involving the female generative organs in the Gynecologic clinic. Eleven of these cases had tuberculous endometritis and of this number only the last three patients will be considered.

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Case I.—A young married woman, aged twenty-two years, entered the University Hospital in January, 1910. At this time she complained of indefinite pelvic symptoms suggestive of pelvic inflammatory disease. A laparotomy revealed the presence of miliary tuberculosis of the abdominal and pelvic peritoneum. The tubes and ovaries did not seem involved to any extent and the abdomen was closed without removing any tissue. About one year later, in December, 1911, the patient returned because of irregular and profuse menstruation. The menorrhagia had caused a marked anemia.

The former history and operation naturally lead to the diagnosis of tuberculous involvement of the uterus. To confirm this, the cervix was exposed by the use of a bivalve speculum and smears were taken from the cervix about the external os. The smears were stained with the Ziehl-Neelsen carbol-fuchsin stain, decolorized in acid solutions and absolute alcohol and counterstained with methylene blue. A microscopic examination revealed the presence of tubercle bacilli of beaded form. The organisms were not numerous and a careful search was necessary to find them. The same day, the patient was anesthetized, the cervix dilated and the endometrium was curetted away for further diagnostic proof. The pathologic department returned a diagnosis of very young tubercles in the endometrium.

The patient was advised to remain in the hospital until her physical condition improved sufficiently, when a complete hysterectomy could be done but she refused to remain.

Case II.—A young, single girl, aged nineteen years, was referred from the Psychopathic ward because of frequent and profuse menses. Her mother and both grandmothers had died from pulmonary tuberculosis. A twin sister had tuberculous peritonitis and was operated upon and recovered. When the patient was sixteen years of age she had what was diagnosed as typhoid fever; a short time later she had her appendix removed. Her symptoms at this time were chills, fever, night sweats, pain in the right side and vomiting. Two months after this operation she complained of vomiting, a rigid and tender abdomen, night sweats and the loss of weight. She was operated a second time and following this she had a suppurating wound and on four occasions had pleurisy on the left side.

As in the first case smears were taken from the cervix and stained. Numerous tubercle bacilli were found. A few days later the patient was curetted under ether anesthesia and the pathologic report of these curettings was "miliary tubercles of the endometrium." One week later Doctor Peterson removed the uterus, both tubes and ovaries. The pelvic organs were matted together and were adherent to the omentum and intestines. The patient made an uneventful convalescence, the wound healing by primary union.

Case III.—A widow, aged thirty-nine years, complained of excessive flowing and severe frontal headaches at each menstrual period. During the interval she was short of breath and had edema of the legs. The personal history was negative and there was no family history of

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tuberculosis. Because of the age of the patient and the excessive flowing it was thought advisable to curette the uterus to eliminate a malignant condition. The curettings showed a miliary tuberculosis. Following the curettage all of the patient's symptoms disappeared and she felt well until one year later when the old symptoms appeared. At this time smears were taken from the cervix and the tubercle bacilli and clumps of epithelioid cells were found. A second operation has not been performed.

To check up the value of this method in the diagnosis of tuberculous conditions of the uterus, three patients who had been curetted and no tuberculous condition had been found were used. Smears were taken from the cervix in each case and no acid-fast bacilli were found. To eliminate the possibility of contamination by the smegma bacillus, the external genitals were carefully sponged off with bichlorid solution and a speculum introduced. The smears were taken from the external os which was plainly visible. As a further means of differentiation of the smegma bacillus the smears were immersed in absolute alcohol after washing in the acid solutions.

The stain was made up of basic-fuchsin, one part; absolute alcohol, ten parts; five per cent solution carbolic acid, one hundred parts.

For decolorizing agents the following were used: (1) two per cent solution of hydrochloric acid in ninety-five per cent alcohol; (2) twenty per cent nitric acid solution; (3) twenty per cent nitric acid solution in ninety-five per cent alcohol; (4) absolute alcohol.

To conclude:

(1) The staining of the tubercle bacillus in smears taken from the cervix, is an aid in diagnosing tuberculosis of the uterus.

(2) This can be done without any anesthetic and could be used to obtain material for animal inoculations.

(3) Great care must be taken to eliminate any possible contamination by the smegma bacillus.

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DISCUSSION.

DOCTOR GEORGE KAMPERMAN: It is important to remember that the organism is not always easily found in smears obtained from the cervix. Negative findings do not mean much, and repeated negative results would have to be obtained before one would be able to state that the discharge was not tuberculous. The finding of the bacillus makes the diagnosis positive. This method of diagnosis does not apply to all pelvic tuberculosis, but only to cases where the endometrium is the seat of the disease. As the uterus is usually involved late, it does not help in making an early diagnosis.

DOCTOR REUBEN PETERSON: Any study throwing light upon the diagnosis, prognosis, or treatment of tuberculosis of the female generative tract is always extremely interesting and valuable. For this reason the work of Doctor Cummings is to be commended. Whitridge Williams in the early nineties called attention to the frequency of unsuspected cases of tuberculosis of the female appendages. Many of

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the specimens removed at the Hopkins Clinic had been diagnosed as inflammatory until careful microscopic examination showed them to be due to tuberculosis.

Tuberculosis of the female generative tract is so difficult to cure and is so great a menace to the patient if left uncured that the radical removal of the appendages and uterus is imperative in the vast majority of cases where any portion of the generative tract is the seat of tuberculosis. This may seem rather radical treatment where the patient is young, but even the few instances cited by Doctor Cummings show the wisdom of the radical treatment, for palliative procedures in these cases did not result in cure. This holds good where the appendages are tuberculous without much peritoneal involvement. In the latter case where the appendages, uterus and peritoneum are tuberculous radical hysterectomy is imperatively demanded.

Certainly experience shows that even the most thorough curettage in most instances is ineffectual to cure tuberculosis of the uterus. The process almost always recurs, just as carcinoma of the body of the uterus recurs because curettage has been powerless to remove all the disease. It is not difficult to see why this should be so, if we bear in mind that tuberculous endometritis is not superficial but involves the muscularis as well as the submucosa.

The paper emphasizes the importance of a careful microscopic and bacteriologic examination of uterine discharges in chronic inflammatory conditions of the uterus and appendages. If the bacilli can be found and a diagnosis of tuberculosis can be made, we are in a much better position to discuss the advantages of the radical procedure before any operation has been made. Only too frequently the relief coming from palliative procedures prevents the patient from seeing the necessity of the radical procedure. Hence, valuable time may be lost and the disease so progress before the patient will consent to a second operation that the cure may be rendered doubtful.

Doctor Howard H. Cummings (closing the discussion): I did not intend to convey the idea that staining the tubercle bacillus in the cervical discharge would give an absolute diagnosis of tuberculosis of the pelvic organs. As Doctor Darling has mentioned, a tuberculous husband whose semen contains the organisms could introduce the bacillus into the cervical canal. This method is only an additional means of diagnosis. The history, symptoms, signs and vaginal findings should all be considered.

CYLINDROMA.

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Literature.—In considering the literature of cylindroma one's attention is directed especially to two things,—the general agreement in describing the tumor, the disagreement as to its place among new

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growths. It is described as tuberous in structure, gelatinous, with a consistence varying from that of jelly to cartilage. Its distribution is about the head, the orbit, parotid and submaxillary glands especially; its growth is slow. There is recurrence after excision, but it is relatively benign in that there are few metastases.

The first description of a tumor that may have been of this nature was given by Henle,[1] in 1845. He designated a case of new growth in the abdominal cavity as siphoma, and describes in this tubes which Birsch-Hirschfeld later thinks are identical with his "vessel cords." In connection with these tubes he speaks of fine threads and bundles of threads forming fibrin nests. But unfortunately, the statements concerning this tumor are not perfect enough to be entirely certain about the resemblance of his observations with those of Birsch-Hirschfeld.

W. Busch,[2] in 1854, first gave a description of a peculiar glass-clear tube in a tumor of the tear glands, which he and J. Mueller believed to be dilated lymph-vessels.

Soon after this von Graefe[3] gave a brief notice of a peculiar tumor of the orbit, but the histologic analysis is not precise enough to be sure that it should be placed with this class of tumors.

The first one to make an accurate study of the new growth in question was von Billroth.[4] In his observations concerning the relations of diseases of the blood-vessels to chronic encephalitis he speaks about a peculiar gelatinous substance which, microscopically, appears at first to be simple mucous tissue, but under more critical examination is found to be in close connection with the blood-vessels. In detail he says: "In the colloid substance the little transitional vessels and the capillaries are surrounded with a thick adventitia consisting of mucous tissue. This tissue appears in a beautifully stamped form having in part round and in part ramifying and anastomosing cells, with one or more nuclei; from this glass-like adventitia extend knob-like excrescences and dentritic vegetations which are manifoldly intertwined among one another or sometimes fused into a compact tissue mass, and for aught I know the development is bound essentially to the vessels. These structures compose the colloid substance and are the essential elements of a tumor-form designated by me as cylindroma." Billroth[5] made further study of this tumor in a recurrence in the case of Busch. He speaks of glass-clear cylinders and tubes composed of a solid mucous substance and that this substance frequently appeared as glassy adventitia about the delicate blood-vessels which were on the point of formation and he mentions also the independent growing-out of the structureless substance into knob-like vegetations. He considered the tumor an especial kind and chose the name "cylindroma" as descriptive of the most prominent characteristic—the clear glass-like cylinders.

H. von Meckel[6] in a paper on "Cartilage Hypertrophy" christens a tumor of this kind "Schlauchknorpelgeschwulst." He mentions also a structureless substance independent of vessels, and considered that the cylinders and balls in question consisted of a homogeneous struc-

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tureless connective tissue substance. Later he[7] speaks of perfect cartilaginous formations that are apparently the very much changed elements of cylindroma, and describes very similar glass-clear globe-like structures under the name of "Physaliden und Physaliphoren," but the connecting link between these formations and the cylindroma is lacking.

Foerster,[8] R. Volkmann[9] and R. Maier[10] considered that the structures in question, that is, the hyaline tubes or cylinders and knob-like excrescences, do not belong to an especial tumor-form but may occur in many different kinds of tumors (carcinoma, sarcoma, enchondroma), and contend that they are essentially a structureless connective substance which arises under the influence of cells, that is, is secreted by them, and originates partly in isolated cells, partly in cell derivatives in the tumor. Billroth[11] himself later speaks of his so-called cylindroma in this manner. Foerster[12] gave these tumors the name of carcinoma with hyaline cylinders and balls.

Tomasi[13] maintains that the tumor arises through three successive stages from a connective tissue corpuscle:

(1) A mass of small round cells arises through increase of the connective tissue corpuscles, and these fill the inside of the lymph-vessels.

(2) These are transformed into physaliphore cells and the latter into a hyaline capsule which may interlace and produce a net of cylinder-like tubes.

(3) Finally inside of the capsules and cylinders a new kind of round cells similar to those which had developed in the lymph canals arises. These he designates as formative cells. (formativ Zellen).

Volkmann, R.,[14] believes that all kinds of endothelium can by pathologic proliferation produce tumors which have definite characteristics separating them from sarcoma, and under simple (not mixed) endothelial tumors of the parotid gland he gives as Observation II "Cylindroma of the Parotid." According to him the three kinds of endothelium, that is, the first connective tissue cells that line the lymph spaces of fibrous connective tissue, that of serous membranes and that lining the lymph and blood-vessels may all proliferate. As a rule more than one kind proliferates at once, and the usual combination is that of the lymph space and lymph-vessel endothelium. In the resulting endothelioma the striking characteristic of the cellular elements is the arrangement of the cells into cords and cylinders and in this respect it differs sharply from sarcoma and resembles carcinoma. It is seldom that the connective tissue framework is a simple stroma of fibrillary connective tissue. For the most part it is transformed into myxomatous, cartilaginous or sarcomatous tissue and shows mucous or hyaline degeneration. This degeneration he explains in any one of the three following ways: first, as a secretion product of tumor cells; second, degenerative product of connective tissue stroma; third, hyaline degeneration of blood-vessel walls.

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Marchand[15] in speaking of this class of tumors says that the hyaline structures have a definite dependence upon the cellular elements of the tumor. The connective tissue sheaths of the vessels and the stroma degenerate when the cell proliferation reaches a high degree; and it is only exceptionally, he believes, that the hyaline origin of the stroma is apparently independent of the latter.

Ewetsky,[16] 1877, in an extended study of the cylindroma problem, with two cases of his own, concludes that the hyaline structures, that is, the cylinders and balls, are a degeneration of connective tissue stroma and this degeneration proceeds from the cell lining the lymph-vessels and connective tissue spaces. He considers the tumors described by Billroth, Maier, Sattler, Koester, Friedlander, and others, and makes the following classification of all tumors described as cylindroma:

I.—PURE FORMS.

(1) Plexiform Sarcoma.
  a—With colloid degeneration.
  b—With hyaline degeneration of connective tissue stroma.
(2) Angioma Mucosum.

II.—MIXED FORMS.

(1) Plexiform angiosarcoma.
(2) Combination of angioma mucosum proliferum with other new formations.

Waldeyer[17] gives to these tumors the name "plexiform angiosarcoma" directly from the plexiform fibroma and myxosarcoma described by Billroth. He thinks it is the outermost adventitial cells which undergo proliferation, and that these cells belong to the connective tissue substance is shown not only in their correlation with the vessels but also in their transformation. In the coccygeal gland, he says, one can demonstrate that the outermost perithelial cells grow out spindle-formed and with abundant transitional forms pass over into the spindle-shaped connective tissue bodies of fibrous tissue. Their peculiar characteristic, that is, cylindrical formations, is brought about through their development from the vessel adventitia, with the retaining of the vessel-like course of the cell columns.

Birsch-Hirschfeld,[18] 1891, thinks that the anastomosing cells, strings or cords are, first of all, vessels which through obliteration become solid cylinders. All the remaining formations proceed from the vessel adventitia. From it originate the delicate threads by a process of budding and it manufactures in a similar way nets of elastic trabeculæ between the cells, many of which show mucous degeneration. As the latter increases the threads become more and more pressed together and in this way it is conceivable that the picture of the primary tumor arises. Finally the infiltration of lymphoid cells (apparently migrating out of the blood path) brings about the hyaline degeneration of the adventitia and some of these lymphoid cells become spindle cells (and

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elastic fibres). The knobs and balls arise in many ways:—through the intertwining of the vessels with degenerating adventitia; through the partial proliferation of adventitia; through the transformation of single lymphoid cells themselves, though whether complicated forms could arise from these alone is questionable. Hirschfeld, as mentioned before, thinks that Henle's "tubes" are identical with his "cell cords;" but this cannot be definitely proved.

Hansemann,[19] according to Lubarsch, 1897, rejects the histogenetic principle of classification, and is of the opinion that new formations which arise morphologically from endothelium can form very different tumors, and makes the following classification:

(1) Those of the type of carcinoma.
(2) Those of the type of sarcoma.
(3) Those of the type of carcinomatous sarcoma.
(4) Those of the type of adenoma.
(5) Forms with specific changes of the stroma.
  a—Cylindroma.
  b—Myxoma.
  c—Chondroma.
  d—Scirrhus.
  e—Mixed forms.

Lubarsch[20] thinks there are angiosarcomata in which it is not the endothelial cells, but the perithelial cells which proliferate, and divides angiosarcoma into blood- and lymphangiosarcoma, with the distinction that there are endothelioma that are not sarcomatous tumors. He divides angiosarcoma into—

(1) Hemangiosarcoma.
  a—Intravascular.
  b—Perivascular.
(2) Lymphangiosarcoma

and reserves the term "endothelioma" for endothelial proliferations proved not to be sarcomatous. The hemangioma, he says, are characterized by richness of blood-vessels and by the occurrence of cell tubes, with a slight intercellular substance arranged around the blood-vessels and determined in its course by theirs. The vessel walls always show mucous and hyaline degeneration which may and does extend out into the connective tissue parts. Thus the angiosarcoma forms naturally a large contingent to the class of myxosarcoma and cylindroma.

Warthin,[21] 1901, in a case of endothelioma of the lachrymal gland calls attention to the similarity of this tumor to tumors of the parotid gland. This tumor is diagnosed as an endothelioma according to its histogenesis, but to indicate accurately its histologic structure it may be styled a myxo-chondro-endothelioma cylindromatodes. The large amount of hyaline in characteristic arrangement suggests, according to Warthin, the cylindroma, but the tumor also contains myxomatous tissue, cartilage and sarcomatous areas so that it is a "mixed tumor."

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In an exhaustive review of the literature of lachrymal gland tumors, he finds that one case only is reported as cylindroma—that by Aievolo in 1887; but according to the work of Koester and Berlin, a number of tumors of the lachrymal gland regarded by observers variously as hypertrophy, adenoid tumors, adenoma, fibroma, scirrhus, enchondroma were to be put in the class of cylindromata and arose from the proliferation of the endothelium of the lymph spaces. Warthin says, however, from the descriptions given by these investigators, the tumors correspond to the one in his case and are to be classed as endotheliomata.

Wood, 1904 ("Mixed Tumors of the Salivary Glands," *Annals of Surgery,* XXXIX, 1904), believes that many of the atypical cell-forms in the tumors of the parotid are of epithelial design, and that, in consequence, these tumors should not be regarded as endotheliomata, but as mixed tumors, probably originating in congenital malformations.

Wood, E. J.,[22] 1905, says that in a primary tumor of the testicle shown to be a large round-celled sarcoma, the metastases in the liver and kidneys are of endothelial cells which is another evidence that the endothelioma is a purely sarcomatous tumor.

Borst,[23] 1906, states that it is not at all certain that the endothelial cells of the lymph spaces and vessels "do not take part in the formation of sarcomata," and therefore considers endotheliomata to be a special form of sarcoma. He thinks there should be a definite principle of nomenclature for the numerous degenerations of the endothelial group, retaining as the chief designation lymphangio- or hemangio-endothelioma and indicating the especial structure or other peculiarities (hyaline, mucous or colloid degeneration, concentric layers of cells, calcification, et cetera), by descriptive adjectives. For example, endothelioma tubulare, cysticum plexiforme alveolare, diffusum, fibrosum, scirrhosum, hyalinum, mucinosum, colloides, psammosum. Such terms as cholesteatoma, psammoma, cylindroma should be entirely avoided.

According to Stengel,[24] on a histologic basis, two forms may be distinguished,—the sarcomatous cylindroma, that is, sarcoma in which there is mucous and hyaline degeneration, and the angiosarcoma, that is, a form in which the sarcoma cells about the blood-vessels become changed into a hyalomyxomatous tissue or cause the formation of this. He also states that mucoid and hyaline degeneration may be found in growths caused by the proliferation of endothelium of perivascular lymph spaces which may surround the blood-vessels and extend along them, and that cylindroma may have such an origin, thus being a form of endothelioma.

Delafield and Prudden[25] in considering endotheliomata state that the stroma atrophies leaving the proliferated endothelium and the blood-vessels as the chief structural elements, or that hyaline and mucous degeneration of endothelial cells may occur, and a collection of these materials, free from cells but surrounded by cell masses, may give a cystic character to a tumor. Such tumors, that is, those in which

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homogeneous or striated cylinders of hyaline or mucoid material are surrounded by layers of cuboidal or flattened cells, form a striking picture which they class as cylindroma.

Ribbert,[26] 1907, speaks of this as a little known but very characteristic tumor, not very common, situated generally about the mouth, head and soft palate; nose, antrum of Highmore, and salivary glands. The name arises from the hyaline knob-like and cylindrical masses which, in section, stand in dependence upon cell masses whose origin is *epithelial* and *not endothelial.* These cells are arranged in heaps and ramifying and reticular strings quite as in carcinoma. Within the knobs and cords are the central hyaline masses which he considers as a secretion product of the cells. The hyaline cylinders he accounts for as follows: the epithelial strings or cords form groups resembling gland-lobules in which arise delicate septa from the hard fibrous connective tissue. These septa undergo hyaline degeneration and form the cylinders. He concludes that the cylindroma is an epithelial tumor whose genesis must be referred to the mucous-forming glands so abundant in the parts in which this new formation is found. It is a relatively benign tumor, not to be confused with colloid cancer. It grows slowly, recurs rather frequently, but only exceptionally are there metastases.

Verhoeff[27] applies Wood's views of the mixed character of the parotid tumors to the similar growths found in the lachrymal gland, and regards them as containing epithelial elements rather than endothelial.

* * *

In reviewing the opinions of the above observers one is struck by the similarity of descriptions of this new growth, and the diversity of opinion as to its origin. For the most part all agree that it is of mesoblastic origin, although there is one notable exception to this, namely, Ribbert, who maintains it is the epiblastic cells which proliferate. Hansemann, while he believes it is endothelium which proliferates, considers that this can produce any kind of tumor formation, either epithelial or mesothelial. Other writers, however, are divided as to what form of mesoblastic tissue it is that proliferates, whether it is the endothelium lining the lymph-vessels and spaces or that lining the blood-vessels or surrounding them. Billroth first considered that the origin of the tumor cells was connected with the blood-vessels, especially the younger vessels and capillaries, and thinks the hyaline cylinder formation so characteristic that he gave the new growth a definite classification and a name—"Cylindroma." Later, however, he seems to agree with Foerster, Volkmann and Maier that it does not form a definite tumor group, but characteristic structures, the cylinders and balls, may be found in epithelial as well as connective tissue tumors. Busch, J., Mueller and Ewetsky believe that the proliferating cell is the endothelium of the lymph-vessels. According to Birsch-Hirschfeld the tumor structure is associated with the vessel

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walls, the adventitia; Marchand and Waldeyer also associate it with the vessel walls. Warthin considers that they arise through the proliferation of either the blood or lymph-vessel endothelium. Meckel believes that the hyaline cylinders consist of a homogeneous structureless connective tissue substance independent of vessels. Tomasi also holds the view that they arise from a connective tissue corpuscle. Lubarsch claims that the hemangiomata form a large part of the cylindromata and myxosarcomata, of which he makes distinct classes. He speaks of the abundance of blood-vessels, and associates the cell proliferation and hyaline degeneration with the vessel walls. According to Stengel such tumors may be a kind of endothelioma formed by a proliferation of the endothelioma of the perivascular lymph spaces which may surround and extend along the blood-vessels. Delafield and Prudden believe it is a form of endothelioma in which there is a proliferation of the endothelium of blood-vessels, with hyaline and mucoid degeneration. Borst considers that all endotheliomata may be a form of sarcomata. He would make the general classification lymphangio- or hemangioendothelioma according as the lymph or blood-vessel endothelium showed the greater proliferation, and then add terms descriptive of the various degenerations found. Wood also is of the opinion that all endotheliomata are forms of a purely sarcomatous tumor.

In general the majority of observers place the tumor in the endothelial group of connective tissue tumors; and most investigators make a distinct classification of this group, not agreeing with Borst that all endotheliomata are merely forms of a purely sarcomatous tumor. With some exceptions noted above they agree that the tumor cell is an overgrowth of endothelium lining lymph- or blood-vessel walls—the majority associating it with the blood-vessels—and the consequent hyaline degeneration depends upon this cell proliferation. Whether it is a secretion product of the cell or a direct degeneration of the wall or a combination of both processes has not been determined.

Without going into a detailed analysis of the views described by the foregoing writers in their investigations, there is not as much confusion in the application of the term *cylindroma,* in the literature, to a certain tumor-form as the variety of views regarding its origin would indicate. It has been applied not infrequently where there are the characteristic cylindrical hyaline formations, and this has usually been in cases having the following clinical characteristics: location about the head, especially the orbit, nose, antrum of Highmore and salivary glands; slow growth, frequent recurrences, lack of metastases—a relatively benign tumor. Not all new growths having these characteristics have been so designated. Confusion has also arisen from the fact that tumors which do not have these definite clinical and pathological characteristics do show this peculiar hyaline structure, for example, sarcoma, and some maintain even carcinoma, that is, not only connective tissue but epithelial new growths. Another cause for confusion in the

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application of this term is the disagreement in the use of the term endothelioma; some, as Borst, for example, claiming that the endothelioma itself is merely a purely sarcomatous growth rather than a distinct tumor-form.

HISTORY OF CASES.

CASE I.—Mrs. P. L. F., housewife, aged forty-one, married, American, entered the hospital early in October, 1907, with a growth on right cheek about as large as a walnut, which is in no way painful. Fifteen years before patient first noticed a growth on this cheek. She could give no cause, and the growth occasioned no pain or discomfort. Ten years ago the growth was removed by Doctor Nottingham, Lansing, but it recurred soon after operation. Patient has always been in good health; no history of tumor in family. Patient had diseases of childhood, and nineteen years ago, puerperal fever; has had two children; one died in infancy, the other is living and well. The present growth was removed by Doctor Smith and cavity curetted. Since going home, that is, about a month after dismissal, patient has reported that cheek shows induration.

Gross Appearance.—Growth of the size of a walnut with distinct capsule. One section showed radiating strands of dense connective tissue between which lay hyaline glassy brittle areas. Some hyaline areas were soft and mucoid, but the majority were firm.

Microscopic Examination.—Sections were made to include, as far as possible, all portions of the tumor and stained with hematoxylin and eosin, also Van Gieson and Kresyl violet. On microscopic examination of all the sections one is impressed at once by the large amount of homogeneous hyaline substance, taking, with the hematoxylin and eosin a delicate pink stain.

Section I, Figure I, shows very plainly the hyaline formation and its structure in round masses, which, in the heaping up of many sections, as in the gross specimen, would give solid cylinders, knobs and balls of hyaline. On closer investigation many of these hyaline masses contain clear spaces lined with flat cells varying in size, in some cases shrunken almost to a line, in others one cell only remaining, and still other spaces absolutely clear; so that it seems as if the process extended from the periphery to the centre and the different pictures represent various stages of completeness of the process of hyaline formation. In many other places there are entirely clear spaces, some large and some smaller, lined with flat cells—young blood-vessels and capillaries lined with endothelial cells. But even about the youngest of these may be seen slight hyaline formation. Beginning with the capillary and new blood-vessel lined with endothelial cells there may be traced in the section every stage of formation from the new capillary vessel to the solid hyaline ball with a line of space only or a few cells in the centre.

Section II, Figure II. Here the proliferation of the blood-vessels is even more marked; the hyaline formation, in most cases, not having reached so advanced a stage.

Cellular Elements.—These in all the sections are of the long flat

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type,—a connective tissue cell. These cells at first glance may appear to have no definite arrangement, but upon closer inspection distinct cell cords or strings can be seen branching and anastomosing; and everywhere following these is the formation of hyaline either in cylindrical or tube-like masses or completely constricted into balls and knobs. These cell cords sometimes form such an intricate network that the idea of trabeculæ and cords is almost lost; but even in such cases very short strings or cords can be made out, sometimes one or two cells in width, sometimes wider. Wherever the cords are straight and of greatest length the width is usually one and rarely more than three cells. Wherever the cords appear wider there is branching and breaking up into an intricate network. Also in the portions in which the cell

FIGURE I.—Low-power view of cylindroma from Case I, showing hyaline change of vessel walls, forming hyaline cords and cylinders.

trabeculæ are the thickest the hyaline formation is not more than the diameter of a cell in width, but from this it is found in all degrees until in portions there are large areas of hyaline with only delicate lines of cells about them. Concerning the minute character of the cells themselves high power shows an abundance of very long flat cells and others more spindle-shaped, with short processes extending from them and forming delicate bridges extending across spaces either clear or filled with hyaline. They give the idea of fibrous connective tissue cells and lead one to think that there may at one time have been a stroma of these delicate connective tissue fibrils.

Large blood-vessels throughout the sections are not numerous; and all of these show hyaline changes in the walls. But everywhere

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through all the sections are small vessels lined with a single layer of endothelium and in these it is significant that the hyaline transformation is constantly going on from periphery to centre, with the cell enclosures spoken of before. All the sections also show some extravasated and decomposed blood.

Van Gieson preparations show a large amount of connective tissue, also a good picture of rose-red hyaline. Amyloid reaction is negative. Kresyl violet shows a small amount of mucin.

Diagnosis.—From the morphology of the most numerous and characteristic cells of the tumor there can be no doubt that this is a tumor arising from proliferating endothelium and hence belongs to the class of connective tissue tumors. But the question arises what kind of endothelium it is which is proliferating,—that lining the lymph vessels, or the blood-vessels or surrounding them, that is, perithelium; or the flat connective tissue cells lining the lymph spaces of fibrous connective tissue. Concerning these points and the classification resulting therefrom there is much difference of opinion as was seen from the foregoing analysis of the literature. From the fact that there is everywhere new vessel formation and following upon this hyaline transformation, I think the proliferating cells take their origin from the endothelium of the blood-vessels. The proliferation of this endothelium forms the cell trabeculæ or cords, and where this proliferation is the most recent the cell cords are the most abundant. Whether the hyaline transformation is brought about by the degeneration of the cell cords or whether it is a secretion product of the cells is another disputed point and one which I think cannot be determined from the sections. A natural explanation of the hyaline formation is that it takes place through the choking off process the cell cords or trabeculæ must undergo in the too extensive cell proliferation. The hyaline formation becoming greater always at the expense of the cells, these are finally shrunken until they become mere threads or disappear altogether. In brief this is a degenerative process. It is here that another explanation for the spindle-shaped cell may be found, and I think a more correct one in accordance with the morphology of the tumor. They are not different from the predominating long flat cell, but merely take on a spindle shape with processes through the process of compression.

Based on its histogenesis, the cells lining the capillaries and new blood-vessels, this new growth is an *endothelioma,* or *angiosarcoma* and in order to designate clearly its very definite characteristic—the formation of hyaline cylinders—the term *cylindromatodes* should be added. In view of this very definite stuctural characteristic as well as definite clinical ones, I think the term *"Cylindroma"* should be applied to this new growth as distinguishing a distinct tumor form if it is understood that it is one of the general class of endothelioma.

* * *

Case II.—Mrs. S. U., housewife, aged sixty-five years, married. Patient comes to hospital because of a growth over the right jaw in

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the parotid region. A growth was removed from this region thirty-three years ago, and again eighteen years later. The present growth was removed by Doctor Darling, January 30, 1909.

Gross Appearance.—On section the tumor is semitranslucent, with hyaline, jelly-like areas. From the cut surface a mucoid material exudes. Denser firmer connective tissue strands radiate through the mass and these contain longer blood-vessels. Between these trabeculæ lie the more hyaline areas. The hyaline areas are firm and glassy, much firmer than myxomatous tissue, and are more brittle than ordinary connective tissue.

Microscopic Examination.—The picture is similar in almost every respect to that of Case I. There is the same proliferation of blood-

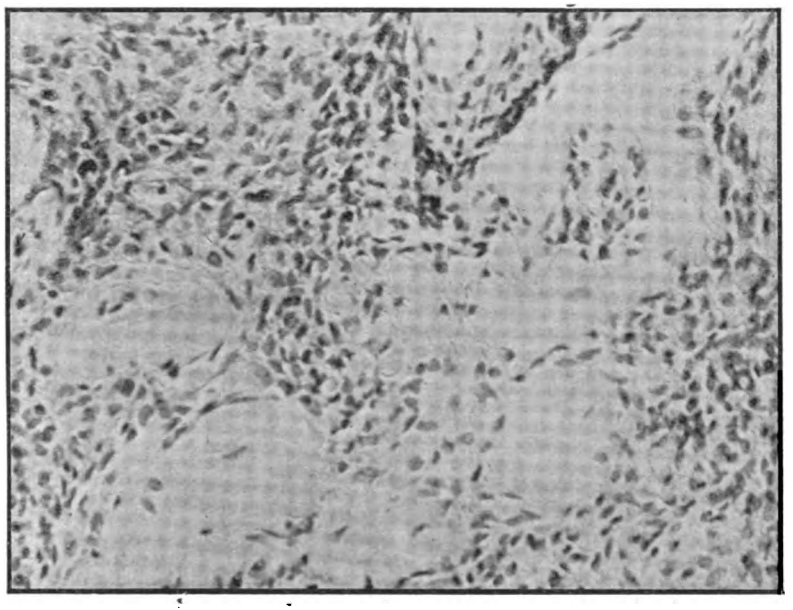

FIGURE II.—High-power view of portion of cylindroma from Case I, showing hyaline obliteration of blood-vessels. In the center of some hyaline masses the endothelium can still be seen.

vessels, with, possibly, greater hyaline transformation. The large vessels are more extensive. Some areas show calcification, and there is also some myxomatous degeneration.

Diagnosis.—In this case we are dealing again with a tumor showing the following characteristics:

Histogenetically—proliferation of the endothelium of blood-vessels and capillaries.

Structurally—hyaline cylinders and balls.

Clinically—slow growth, recurrence (the second), no metastases, location, jaw, parotid region.

In addition it shows calcification and some myxomatous change.

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According to its histogenesis it may be named *myxoendothelioma* or *angiosarcoma cylindromatodes,* with calcification; but, better, to designate a tumor form including only the characteristics mentioned above, *cylindroma,* with myxomatous change and calcification.

CASE III.—Mrs. E. G., housewife, aged fifty-seven years, married. Patient comes to the hospital with a history of slight continuous hemorrhage from the uterus. She was curetted five months ago, but no pathologic examination was made of the curettings. Clinical diagnosis, carcinoma. Hysterectomy, June 3, 1909.

Gross Appearance.—Medullary growth with hemorrhagic and necrotic areas. In the nonnecrotic areas hyaline trabeculæ are visible to the naked eye, as translucent, glistening tortuous cords or bands.

Microscopic Examination.—Sections cut from this tumor and stained in the usual way show two distinct parts—some in which there is hyaline formation with cell cords and trabeculæ and others in which there are areas of sarcoma cells only. Section shows a portion of the tumor combining these areas, the hyaline cylinders with the cell trabeculæ and the sarcoma cells. There is also much breaking down, as shown by the amount of hemorrhage and the extent of hyaline degeneration.

Diagnosis.—In some respects this tumor is strikingly different from the preceding cases.

Histogenetically it is composed of mesoblastic cells, but these are of two types, the round-celled sarcomatous and the endothelial, the sarcomatous cell being the more abundant.

Structurally in addition to the hyaline cylinders and cell cords there are large areas entirely cellular.

Clinically it has grown relatively rapidly, causing constant slight hemorrhage; its location is the uterus. A clinical diagnosis of malignancy had been made.

According to its histogenesis the new growth is a sarcoma and endothelioma cylindromatodes. Whether it was originally a cylindroma, in an unusual location, which has undergone sarcomatous degeneration or a sarcoma which has undergone cylindromatous degeneration I think could not be told from the sections. As it is now, however, it is composed chiefly of cells of the sarcomatous type, with degenerations that have the striking characteristic of the group of cylindromata, and may be designated as a *sarcoma cylindromatosum.*

CONCLUSIONS.

In comparing these cases with those reviewed in the literature it can be seen how there might be unanimity in the descriptions of the tumor, and diversity of opinion as to its place in the classification of new growths.

All of the three foregoing cases show the characteristic formation of hyaline. This is mentioned by every observer, even those who would place these with epithelial new growths. The first two cases show that this follows definitely upon an overgrowth of blood-vessels and capil-

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laries, with proliferation of the endothelium lining them, and, I think, on this alone. This also agrees with the views of many observers, notably, Billroth, Marchand, Birsch-Hirschfeld. In the third case there is proliferation of another kind of connective tissue cell as well, and one can see in this how the opinion of Borst—that all endotheliomata are merely a form of sarcoma—could be held.

The first two cases are also about the head; they are both recurrences of very slow growth in individuals over forty years old, with a history of the primary growth fifteen to thirty years previous. This establishes the fact that they are relatively benign and have no metastases. This, too, is in accordance with the findings of most

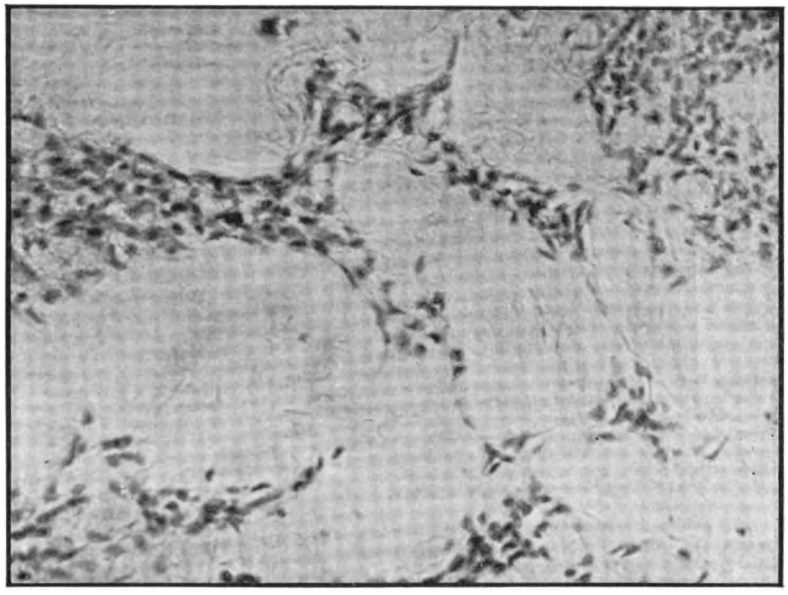

FIGURE III.—High-power view of hyaline cylinders and cords from cylindroma of Case I. The hyaline masses represent completely obliterated blood-vessels.

investigators. Ribbert, although he classes this tumor with carcinoma, speaks of its slow growth and very infrequent forming of metastases, and makes a point of the fact that it must not be confused with colloid cancer. But in the third case the growth is rapid, there is clinical evidence of malignancy, and the location is not the usual one for tumors characterized chiefly by the hyaline formation of cylinders. In such a case as this it can be seen how the opinions of Foerster, Volkmann and Maier should be formed,—that new growths of this kind do not belong to an especial tumor-form. As stated before, Billroth himself came to hold this opinion.

In conclusion the three tumors studied show, first of all, a characteristic hyaline formation. Clinically they form two classes, one in which the new growths are recurrences, the first and second, in primary

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tumors of very slow growth; the other in which the growth is rapid. One class is situated about the head, in connection with the parotid gland, and is similar to tumors described in the literature often as *mixed tumors* of the parotid and submaxillary glands and known to be relatively benign. The other is situated in the uterus and is malignant.

Histogenetically they rise from the endothelium of the blood-vessels and capillaries and hence are endotheliomata, or angiosarcomata and to describe their peculiar hyaline formation—*endotheliomata cylindromatodes.* But this does not designate them sufficiently because, as a rule, the endothelioma is malignant in nature. Two of these tumors are distinctly not so; the third is malignant but here there are numerous sarcomatous areas and the malignancy can be assigned to this cause. Moreover this tumor is not associated with serous glands. There is, however, the formation of the peculiar hyaline cylinders that characterize the other two tumors, and I think it must be granted that a degeneration which takes this form can and does occur in connective tissue tumors—a sarcoma may become cylindromatous just as an endothelioma, especially of the more nearly nonmalignant type, may and occasionally does become sarcomatous or even carcinomatous. This, I think, need not interfere with the use of the term *cylindroma* to designate clinically and pathologically a distinct class of tumors, as follows:

Those of the connective tissue group arising from a proliferation of endothelium lining blood- or lymph-vessels, characterized by the formation of hyaline cylinders and cell trabeculæ; slow of growth, recurrent, without metastases as a rule; located about the head and face, in relation usually with a serous or serous and mucous gland. Understanding the term *cylindroma* to signify histogenetically *endothelioma cylindromatosum,* it places such new growths in their proper morphologic class and excludes the misleading clinical features that the term endothelioma implies. Other forms of tumors with hyaline cylinder formation of the blood-vessels should be designated primarily according to their type, modifying this by the term *cylindromatosum* if the hyaline change is sufficient to deserve especial notice, as for example, *round-cell sarcoma with cylindromatous areas, carcinoma cylindromatosum, adenofibroma cylindromatosum,* et cetera. The term *cylindroma* is then restricted to the tumor described above in Cases I and II, and is used in the sense of an *angiosarcoma* or *endothelioma cylindromatosum.*

I desire to express here my great indebtedness to Doctor Warthin for suggesting this subject to me and for his assistance and advice in furnishing me with the clinical material and books.

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REPORTS OF CASES.

A CASE OF ANURIA.

DEAN LOREE, M. D.
Department of Surgery.

I had the satisfaction last year of presenting to you a case of calculous anuria. The case of anuria which I will report tonight is brought about by an entirely different condition.

The patient is a merchant, sixty-seven years of age. He came to

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the University Hospital, March 13, 1912. About a year ago he was operated in another city for hemorrhoids and vesical polypi. He was told at this time that he had an enlarged prostate, but no attempt was made to remove it. After returning home he enjoyed unusually good health for three months, when his first urinary symptoms began to appear. These have grown steadily worse to the time of his entering the hospital. One week before coming here he took an active cathartic with good results the following morning, and accompanying the passages he had bladder evacuation. The following night he did not arise to pass water, which surprised him, as he had been voiding urine nearly every hour for some time previously.

When I first saw him he was beginning his seventh day of almost complete anuria. His doctor had catheterized him every day, but found a perfectly dry bladder. The patient had, however, on two or three occasions, passed a few drops of bloody urine, not to exceed one ounce in the six days.

He came from the station in a hack, walked into the hospital and said he never felt better in his life. His temperature and pulse were normal. He was catheterized, and to make sure that the catheter was in the bladder, normal salt solution was injected, which returned quite clear, and an equal amount. Rectal palpation revealed a large pelvic growth of stony hardness, and, in all probability, prostatic in origin. I advised him that the growth was obstructing the urinary outlet of both kidneys, and the only chance of saving his life would be to drain both the latter. He chose the operation and I performed bilateral nephrotomy, within a short time after he entered the hospital.

The peculiar thing about these cases of anuria is the long tolerant period without symptoms of uremia. It is possible, but not probable that both ureters became obstructed by the growth at the same time. His operation showed an enlarged left kidney and the right one somewhat atrophied. In all probability the latter had been obstructed first and the left kidney had compensated for its loss.

DISCUSSION.

Doctor Albion Walter Hewlett: A few words in regard to the blood pressure of this patient. During anuria the blood pressure usually rises unless the patient is too weak to react to the stimulus. This rise may occur rapidly as in the rapidly fatal case reported by Brasch or it may rise slowly. In Pässle's patient the blood pressure on the sixth day of the anuria was 150 and before the twelfth day, when the patient died, it had risen to 180. Doctor Warren saw this patient when he entered the hospital and found the blood pressure 185. On the day following nephrotomy it was 165, on the third day, 185, on the fifth day 135, and from then on it did not rise above 125. The slow return to normal accords with the view that the increase in pressure was due to the retention of urinary products normally eliminated by the kidney.

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A CASE OF ERYTHEMA MULTIFORME.

JAMES F. BREAKEY, M. D.
Department of Dermatology.

The patient I present this evening is an extremely interesting one, at least from a dermatologic point of view. Upon the hands, feet, forearms, ankles and legs he has lesions most beautifully typical of erythema multiforme. You will notice these lesions are mostly upon the dorsal surface of the hands and forearms and anterior surfaces of the feet and legs. The body is comparatively free, though exhibiting a slight limited eruption. The whole eruption is symmetrical.

The eruption is of about six weeks duration and was preceded by a marked stomatitis. He has had this stomatitis before without the skin lesions. Whether or not the stomatitis was a localized manifestation of erythema multiforme involving the mucous membranes only, or whether the mouth lesions opened up an avenue of infection causing the cutaneous condition is a question, but from the picture the patient presents it would seem probable that the condition from the first was purely an erythema multiforme.

One of the most interesting things in connection with this case is the amount of mucous membrane involvement: when he entered the hospital the mucocutaneous borders were all involved, the eyes—particularly the inner canthi, the lips and the meatus urinarius. His venereal history was negative, and he showed a negative Wassermann. There were marked lesions on the glans penis and on the cutaneous border and into the mucosa, these originating at the meatus with extension in this region afterwards. The condition is a toxic trophoneurosis.

Ordinarily there are no subjective sensations in a pure erythema multiforme. He has had very slight sensations and some irritation, particularly about the eye, but that is considerably better than when he entered. He ran a temperature up to 105° and is still running a febrile course. This, however, is explained in part at least, by the chest condition for he has a pleurisy involving the lower right side, anterior and posterior, and a patch on the left side. Whether this is a coincidence or is connected with the original toxemia of course is another question.

Without visceral involvement such patients practically never have any temperature and I think what he has is probably due to the visceral troubles from which he is suffering. Under ordinary circumstances he ought to make a slow recovery especially from the skin condition. A certain number of new lesions may develop but they will subside in their intensity and he ought to develop a clear normal skin, with the probability of occasional recurrence during the next two years, after which time such cases rarely have further trouble.

The case is interesting because it is so classical and comparatively

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infrequent, especially the associated mucous involvement. He has practically all the forms of lesions connected with erythema multiforme, and variations in color from the original focus which is usually more or less bright pink, becoming darker, the iris lesions being concentric circular lesions with variations in color and elevation.

A CASE OF TRACHEAL TUG IN A SUPPOSED MEDIASTINAL TUMOR.

ALBION WALTER HEWLETT, M. D.
Department of Medicine.

This patient has signs of a mediastinal tumor with extensive enlargement of the glands in the neck. One of the latter was removed but showed only a chronic inflammation. The Wassermann was negative. The *x*-ray showed a large mediastinal shadow which did not have the characteristics of an aneurysm. A marked tracheal tug was demonstrated. When the tracheal tug was first described it was thought that this would prove a valuable differential point in distinguishing aneurysms from thoracic tumors but it is certainly not pathognomonic and the present case is an apparent exception to the rule. I have recently seen a patient in whom a marked tracheal tug led to the diagnosis of aneurysm but the autopsy showed a large intrathoracic sarcoma.

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TRANSACTIONS
OF THE
CLINICAL SOCIETY
OF THE
UNIVERSITY OF MICHIGAN

STATED MEETING, MAY 1, 1912.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.
REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

THE RELATION OF PHYSICIANS TO THE PEOPLE.

HENRY BAIRD FAVILL, A. B., M. D.
PROFESSOR OF CLINICAL MEDICINE IN RUSH MEDICAL COLLEGE.
CHICAGO, ILLINOIS.

My audience of this evening is more specifically a professional audience than was my audience this morning. From one point of view this rather adds to my rather pleasing task and probably on the whole gives me a greater gratification in being invited and permitted to talk to you than to talk to an audience less distinctly of medical training. Because I have it in mind tonight to talk out of experience, to talk out of the things that have been coming in upon me for thirty-two or thirty-three years that I have been in medical practice, to try to give to you as far as I can the fruits of my own observation as to what is going on in this medical business, and particularly as to what is going on in this medical business in its relation to the public. Of course, I do not need to call your attention to the fact that we have a very specific and peculiar and intimate relationship to the public; that the relationship of the medical man to the people in the community is one of exceedingly delicate intimacy and responsibility, and that insofar as these things characterize that relationship, in that far obligations go with it that are correspondingly imperative; therefore it will appear to you clearly that I take this medical "business," as I characterize it, very seriously: that I regard it as one of the very most serious questions in life, a more serious question, perhaps, than occurs in any other vocation, because of the peculiar relationships, of intimacy of knowledge, the unequal capacity on the part of the two parties, the doctor and the patient, to judge in the situation, and all of it carrying with it an obligation of the

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very highest degree as to the character of the service which shall be rendered. There is hardly any other walk of human relation in which there is such an inequality of footing and where the obligations are so absolutely imperatively moral and ethical in their demands. That constitutes my platform so far as my talk to you is concerned.

These are stirring times. I am not now speaking particularly of medical matters. These are times of great conflicts, of great social activity, great social change—times of social unrest if you choose—and a social unrest which is not without reason, not without foundation and ample justification: the people of the world are coming more and more markedly to see the line of cleavage between those who get more than their share and those who get less than their share. The fact that there is a very large and ever increasing number of people who get enough as a fair average is beside the point. The distinction is becoming more and more obvious all the time between the people of privilege and the people of no privilege and this is permeating the whole of society. We are running right along in every possible line to an issue upon that question. It may be in politics, in business, in industrial things, in social relations, but whatever it is we are progressing, and everybody who stops to think about it sees that we are going along to an issue on this question of the division of the material benefits of life between the various classes of people in the world. Now this is becoming so strong as to cause political students and social students great uneasiness: are we going on to revolution? or are we going to find a way out of this? Is it sufficient to say that the world always has come up to this kind of issue and met it in its extreme of exaggerated development and gone to pieces on the issue? Is it to be concluded that the world always will do it; or that a study of history and of facts should be invoked for the solution of this question in some nonrevolutionary way. This is the question before everybody today and I merely take a few minutes to refer to it so that you may not fail to see that what I have to say about the medical profession is not at all a side issue, but that we are a part of the world development upon this line, and that we have got to see where we stand and whither we are tending, because, if you stop to consider it, one of the directions in which inequalities are most palpable and obvious and important is the control of public health, the control of the resources of medicine and their application to human needs. Are the resources of medicine today generally widely, freely open to all the people of the world? Now the answer to that is unequivocal and positive—they are not. Are they as open as they ought to be? That is almost answered without asking. It is the inevitable rule in the abstract that the resources of medicine are open only to those with the ability to pay for them. Of course this is not as broadly true in some departments of the subject as it might be: the very poor, the hospital poor, the pauper poor, the people who are really taken up by society and cared for under the resources of medicine, apply for and receive with reasonable abundance and

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reasonable freedom, the resources of medicine, but bear in mind that that is a small fraction of the people. The question is: Who is poor? and the answer is, in the vast preponderance of cases of individuals at large in the world: That person is poor who cannot go to work tomorrow morning, no matter how well or independent he is today. In other words, it is work, which means the physical capacity of the individual, is the dividing line between independence and dependence upon the world soon or late.

Now when you come to divide the people with regard to the medical resources on such broad lines as that, in other words, when you come to widen out the term "poor," which I use now without opprobrium, to include all those people who become at a given line of physical inability, dependents, then answer the question: Are the resources of medicine freely open to all the people, the poor included, and the answer is unequivocally—they are not. If they go to a hospital, yes; if treated in some dispensary, yes—not by any means; but if they are treated by the rank and file of the physicians scattered throughout the country, particularly in the poorer districts of the great cities, they may be treated conscientiously and given all that the doctor can rake and scrape up to offer, but the fact is that what they are offered and get is practically nothing, for reasons which I shall point out. We talk about the physicians treating the poor and getting only twenty-five or fifty cents a visit; let me say to you that for the values and benefits accruing from these visits, in the majority of cases they are paid high. Not because the doctor has not done all he can do, but because all that he can do is utterly ineffective in the face of the inability on the part of the patients and their families to do their part. In other words, if the doctor furnishes the best intelligence in the world, but cannot do anything with the social question underlying this matter of physical disability on the part of the patients, the most intelligent man, if he were there could accomplish nothing. Now this is the crux of the whole situation: we are trying to practice medicine under conditions in which the very circumstances nullify everything we do, do you see? and when I say that the doctor is paid high when he receives fifty cents for a visit I mean that the best *opinion* in the world is practically worthless. This is the condition in which most of the people of the world find themselves today in the industrial classes. Everybody who becomes dependent because of failing health finds himself at that point where the transition from the independent to the dependent class takes place. Now do you see that this is a very important issue, a very important question, because in the first place from the great humanitarian standpoint it is unthinkable that we should not give everybody a chance to be well if possible. But outside of the humanitarian point of this question you are going to find more to be true and you who intend to be physicians are going to find it very strongly marked in the course of a few years. The state will see that the health of the people of the state is its greatest asset and that it has got to be main-

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tained; that the physical condition of the people is the basis of their prosperity and efficiency: We have got to see to it that the people are in the highest state of efficiency that reasonable application of medical law can effect; therefore, by hook or by crook the people of this state intend to have medical opportunities. Now that is just as sure to happen as the sun is to rise and it is pushing upward and happening here more or less, but it has not begun to happen as it will happen, and the question is, How are we intending to meet it? What are we intending to do about it? It is not just medicine that is needed, it is not intelligent advice alone, but coördination and coöperation of social resources, which shall not only bring the poor of a given situation the best advice and if necessary the best quality of medicine, but further than that such social adjuvants, such as food, habitation, et cetera, as will make the advice and treatment effective. That is what is bound to come. The doctors are not going to treat their patients as if they were the autocrats of the situation: they will be only a part of the social machinery of sickness. So far as the development of these things is concerned the physician himself has been far in the rear and the sociologists have been in the foreground while the physicians come trailing along behind, here and there one right up at the front, but most of them rather indifferent.

The development of public health relations and of boards of medical treatment of the people at large—I shall not say the poor any more—necessarily, in a sense, in view of what we have been brought up to think as the interests of the medical profession, conflicts with their ability to build up a practice out of the poor on small fees! It is in conflict with all sorts of privileges belonging to the medical profession! Those things are to occur all the time, as they are occurring all the time. There is no question, however, that the development is going to foreshadow a strain between the social forces of society and the medical forces of society. There is a definite danger in that situation. There is more danger in that situation right in the family now, let me say because of the inherent stupidity of the medical profession with reference to its ability to "get in wrong." It is perfectly astonishing how the medical profession can get in wrong even when it is right; to so get in conflict with the progress of things as to appear to obstruct the ethical and moral devleopment of social forces. It is really necessary for the profession to be upon the ground and not to fail to see that it should be the leader in this thing and not a camp follower, and that is the thing that we find the medical profession is prone to be. It is hard to say just why. Now if it has come to pass—as I believe it has—that more and more the tendencies of the community are drifting to the socialist, if you understand what I mean by that term—more and more taken out of the narrow relationship of physicians and patient and put into the broader relationship of reëstablished efficiency; of reëstablished independence based on physical well being; if the future is to be like the past, do you not see the importance of our being leaders in the matter, not followers? But how are we to be

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leaders in this matter? How can we be anything more than the faithful administrators of our particular function? We are the doctors! we are the men who are looking out for the question of disease; we are the ones who take care of the accidents after they have happened. There is the question of *conception;* there is the crux of the whole matter. Are we the patchers up of accidents? Are we the preventers of disease? Now there is the cleavage of the medical profession; it is incumbent upon us to make the choice: what are we intending to do? I do not want to be misunderstood as saying that our function as physicians to the sick, surgeons, general ministers to the suffering is a thing of the past. Do not misunderstand me; that is and always will be the function of the physician; but bear in mind, logically that function is eventually a stultification if we simply content ourselves to be machinery merely for patching up what has happened. Somebody has got to take charge of the vast territory in which things have not yet happened. Shall it be the patient or shall it be somebody else? That is the question. It is right in front of us and we are obliged to make up our minds what we are going to do about it. If our function as ministers to the sick is satisfactory perhaps it might be justifiable for us to say: Well, we can do only so much, and let somebody else do the rest; but let us just look at that now for a minute: the great majority of acute sickness gets well and would get well without any medical attention whatever. Medical attention in the majority of the acute illnesses is of the nature of a lookout for breakers—to see where it might possibly be best to intervene, and in these days, fortunately, seeing most of the time where it is best not to intervene. That is the function in most acute disease. Most chronic disease with which we deal, which covers the territory of the greatest human distress in which we do the most good as ministers, in reference to accomplishing fundamental results, is, by the time it comes to us, an indelible scar that cannot be eradicated. That is rather discouraging to represent to the young in the medical profession,—to think that most of the kidneys, the hearts, the livers, the blood-vessels and other vital ailments that come to us are practically incurable and that the most we can do is to offer comfort and relief. Intensely interesting is the matter of pathology; intensely interesting and a matter for careful study, but after all in point of achievement it is not enough, and that is why you find men branching out into other fields, and find faithful earnest men entering preventive medicine. The future of medicine is preventive medicine. I want to call your attention to what I want to forestall at this moment and at other moments like this. If we do not see the point, and if we as medical men do not see the inside of things and the progress of things, the necessarily inevitable progress of things; if we allow ourselves to get into the position of saying that this trend of medicine is bad for us and for the profession and we cannot tolerate it, it will go on without us; in the long run we shall find that there has occurred a schism in the affairs of the world relative to us, and one that cannot be crossed easily; we have not done our

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duty as sociologists, and yet of all classes of people at work in the world there are none that begin to have the foundations in ability and experience and insight that we have as sociologists if we choose to develop our view along that line. So I have come to the conclusion that the medical profession of this and every country in the same way is in serious danger, a danger of losing, I will not say, "standing," which sounds a little selfish; I will say, of losing its constituency, of losing its leverage, of losing its opportunity to be to the world what it could be. The medical profession is the greatest of callings, broadly considered, and it is really unthinkable as a general idea that we should do anything short of meeting possibilities in the case.

All of this is preliminary to this broad idea as I am talking it now. In order to really accomplish anything with this whole proposition the people must be better educated; the people at large must be brought into a conception of things that should be in keeping with this that I am talking to you about now; and how in the world is that to be done? How take the tremendous number of people and go through that thing and accomplish anything, any kind of education that shall amount to anything and be effective?

You know, perhaps, that the medical profession has tried to get into the United States Government some kind of public health service. This is limited mostly to foreign and international service. Why does the medical profession want it? Why do they want a bureau of medicine? The opponents to this measure will tell you that they want it to establish a medical monopoly. This is seriously alleged and not only seriously alleged but very widely believed; that the medical profession is trying to establish a monarchy, oligarchy, something or other for the purpose of oppressing and treading down the people to the permanent destruction of democracy. That is the only answer I know on that side: that is what is set up as the reason why the organized medical profession of this country wants a public health service. Now the facts: The medical profession wants a public health service for the purpose of furthering the intelligence and education of the people. It has various phases and goes off into various lines of development, but after all it comes down to the question of disseminating intelligence among the people to the end that the efforts of the medical profession may not be futile. Why now is it necessary to have the government do this? In the first place the government could not do anything more. The government has never had any purpose or record of having undertaken to do oppressive things: it could not do them constitutionally so there is no use talking about it. What they can do is to recognize and stimulate scientific research and administer the information so gleaned wherever it is possible to administer it. The government can educate the people of this country to the question of the preservation of health and there is no other body in the country that can adequately do it. The American Medical Association is trying to do it as far as it can. It has a distinct organization for this purpose, but it must be

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perfectly obvious to you that it is a mere makeshift. Anything that the American Medical Association can do in the way of organizing a bureau of education must of necessity be limited as far as the mass of the people are concerned. It is perfectly obvious that nothing can be done, except with the assistance and insistence of the government. I hope this will sink into you for you will many times have to come into conflict with this very question; you will meet just this kind of opposition. What has the medical profession to gain by this thing, and why do they fight for it? What axe has it to grind? That is the question because it is inconceivable to the average man that people can do such a thing without some selfish motive.

The United States government, like other governments, should take the responsibility for the education of the people along the lines of public health. It is bound to happen. Now I am going to close with just a reiteration of what I have been saying: Let us not permit it to happen without our being in the field. Let us not permit it to happen without our being involved in the whole question, in the whole territory that is to be opened up when it does happen. You say it is nothing to you what this or that community does. Bear in mind that is has begun and that it is everything to you; there is not a question that will arise in your community that is not your question. If it is a question involving the interests of the people, by as much as you are nearer to the people than others, the more will it interest you. Bear that in mind and I have no hesitation in saying that the key to success for young physicians today, outside of that which every man knows, good solid work, is not to join the church—that used to be, you know; not to get into society; not to marry fortunately— none of that kind of old-time claptrap. The key to success in the medical profession today is to have hold of the very essence of social development, particularly if you like as related to medical affairs; being a factor in the situation earnestly and clearly and with a broad view as to whither we are going;—that is the advice that I have to give to medical students today.

100 State Street.

DISCUSSION.

DOCTOR VICTOR C. VAUGHAN: I shall be very glad to say a few words. I hope that you have all enjoyed Doctor Favill's talk as much as I have. Medicine is very fast becoming a social service. What is the use of prescribing hydrochloric acid and pepsin for a man who has not anything to eat? What is the use in trying to doctor up a man's lungs when he has to sleep in a prison cell, or in a crowded room? What is the use in trying to preserve a man's nervous system when he is living under circumstances that are driving him insane? The medical profession has got to get out into the world and render social service and improve the conditions under which the people live. In spite of Doctor Favill's presence I am going to tell you one or two of the things that he and some others have done. Some years ago the government of the city of Chicago was most corrupt. Men of the most unscrupulous character were elected as aldermen and sat in the

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legislature of the city of Chicago,—men who carried the wards in their pockets, figuratively speaking. A little band of men got together and determined to relieve Chicago of that shame. They formed a municipal voters' league and gave up their time—and all were busy in their professions—and they made it their business to publish the record of every man who aspired to an office in the city of Chicago, and they said: "Do not vote for John Jones for he is a crook." That is the way they came out. These nine or ten men, refusing to accept any office for themselves, went to work to purify politics in Chicago so that municipal government might be better, so that money voted for municipal sanitation might be spent for the benefit of the people. Today no man can be elected to the board of aldermen in Chicago unless he has the approval of the voters' municipal league. Corruption has been done away with. Today there is nowhere in the whole world a more efficient city government than that of Chicago with money voted for municipal sanitation and the money has been spent properly. That is what nine or ten men did in a social way for Chicago, and for three years Doctor Favill was president of that board. That is the kind of work that he has done. Denying himself much time, giving up his energy, neglecting his practice to a certain extent in order that he might do this social service.

A few years ago the state of New York passed a bill known as the "Bakeshop Bill," in which they attempted to provide for sanitary conditions under which people might work. The bill was passed and such shops had to be cleaned and well ventilated, have proper temperature, et cetera. It was taken up to the Supreme Court of the United States and the wise men of this court decided that it was unconstitutional, because it interfered with individual rights: that a man could work under any conditions if he wanted to,—in filth, and under the most unsanitary surroundings if he choose. The all-wise Supreme Court said he did not have to work there. Can we all choose the conditions under which we work? The great legal profession at that time upheld the opinion of the Supreme Court.

Some years ago a judge of the Supreme Court was asked to appear and explain himself before the medical conference on their declaring the bill unconstitutional. Doctor Favill was selected by the medical profession of this country as the man to meet his arguments and to chastise him—and he did it: I heard him.

This is what Doctor Favill has done, a man in a large and busy practice in a great city, and do you not think he has been of greater benefit to his profession and to the world than if he had stuck entirely to his patients? Medicine is becoming more and more a social service and we must recognize this. The world is to move forwards or backwards—I think forwards, and I think it is to move forwards rapidly and in the van leading the procession should be the medical profession, and its motto should be: "Salus populi suprema lex est,"—the welfare of the people shall be the supreme law of the land.

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TRANSACTIONS
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STATED MEETING, JUNE 5, 1912.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.
REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS.

THE RECENT SORE THROAT EPIDEMIC IN ANN ARBOR.

FERRIS N. SMITH, A. B., M. D.
INSTRUCTOR IN OTOLARYNGOLOGY IN THE UNIVERSITY OF MICHIGAN.

ABOUT three months ago it became apparent to the practitioners of Ann Arbor that a form of virulent sore throat, suggestive at times of streptostaphylococcic and at other times of diphtheritic infection, was rapidly becoming prevalent in the community. This illness has assumed various forms, ranging from a superficial septic throat to a condition characterized by great congestion and swelling, with membrane formation, universal edema of the throat structures, suppuration, ulceration, and cellulitis followed by fatal purulent meningitis, peritonitis and general septicemia. The onset has been sudden, the prostration out of all proportion to the area of apparent infection and cellulitis has been a frequent complication. Severe headache, slight soreness in the throat and some difficulty in swallowing, together with pallor and the appearance of grave illness, have been the first warning to the patient. Following this has been a pyrexia varying from a slight rise above normal to 105°, a full bounding pulse rarely exceeding 100 in rate regardless of temperature elevation, slight increase in respiratory rate, normal leukocyte count, and not infrequently albumin and granular casts in the urine. In all cases smears and cultures from the throats have presented large numbers of streptococci occurring in short chains and very frequently in pairs. The cocci in the chains appear to occur in pairs. These organisms are Gram positive and present a definite capsule in smears. There is an abundant raised, moist growth upon blood

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serum. A full report upon the morphological and cultural characteristics of the organism is not presentable at this time.

The early cases in this city were scattered and seemed to bear no direct relation to each other, but later cases point strongly to some article of food or drink as the carrier of the organism. Eighteen cases originated in one boarding house and among these were the most extensive and complicated involvements noted. Many other cases of milder types have been scattered throughout the town. An effort to locate the organism in milk or drinking water is being made in the Hygienic laboratory.

Epidemics identical with this were reported from Boston about one year ago, from Chicago and the surrounding country early in March, and from Baltimore later in the same month. The source of the Boston epidemics was definitely located in the best dairy in the city, no definite conclusion has been reached in the Chicago outbreak—but milk is suspected, and no definite source of the disease has been located in Baltimore. The most severe cases in all places have been among adults and the fatal cases have been most varied in character. The majority of deaths in Chicago resulted from purulent peritonitis some days after the onset of the disease. There were cases of general septicemia, arthritis, endo- and pericarditis, suppurating meningitis and pneumonia. A similar epidemic was described in England two years ago and the source traced to a suppurative udder disease in cows.

Thirty cases have come to the attention of this clinic, three of which were cases treated by other practitioners. Many other cases are being treated in the city, but data concerning them is not available at this time. The cases studied here admit of a clinical classification into several groups:

(1) Superficial septic throats.
(2) Membranous septic inflammation.
(3) Edematous inflammation.
(4) Suppurative cellulitis.

The first class—superficial sore throat—embraces the great majority of the cases. Its onset is sudden and severe. The patient has sudden intense headache, occasional pain in the back and legs, sore throat, increasing difficulty in swallowing, and marked prostration. He is pallid and appears to be afflicted with some grave illness. The pillars, tonsils, posterior pharyngeal wall, soft palate and uvula are very red and swollen and the uvula is frequently edematous. The fever rarely exceeds 102°, the pulse is full and relatively slow and the respiration slightly increased. Only infrequently is there a moderate leukocytosis and the urine frequently presents a considerable volume of albumin and granular casts. These cases run a course of three to eight days and leave the patients much exhausted. One such case in this series has been complicated by an acute suppurative otitis media and mastoid tenderness without leukocytosis. Another died of streptococcus septicemia in four or five days. A third case developed cervical cellulitis some days following the throat infection. This suppurated

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and the patient died of purulent meningitis following septic thrombosis of the jugular vein and lateral sinus, and a fourth case developed a fatal purulent peritonitis. In both of these latter cases the infiltrated areas in the neck were incised for drainage. No pus was discovered at the time of operation, but free purulent discharge occurred some hours later. It has been this group of cases which has given rise to the majority of deaths in other epidemics, the fatal condition appearing some days after apparent cure of the patient.

The second class of cases—membranous septic inflammation—is characterized by all the signs and symptoms of group one plus the formation of a dirty grayish white membrane which is irregularly disposed upon the tonsils, pillars, soft palate and pharyngeal wall. It strips easily without bleeding and consists largely of pus cells, streptococci and detritus. Various degrees of edema are frequently associated with this class and is most frequently noted on the uvula and pillars. A typical example of this group entered the clinic with a temperature of 104°, pulse 104, a grayish red throat, patches of membrane on tonsils, pharyngeal wall and soft palate, marked edema of the uvula and pillars with bulging of the anterior pillar on the left side, no leukocytosis and acute septic nephritis. Two hours later the temperature was 103.4° and pulse 92. The pulse did not exceed 100 again during the disease, despite temperature of 103.4°. Frequently the pulse was below 90 with such a temperature. Eight hours after admission the membrane had disappeared, the throat was scarlet in color, the patient had a typical strawberry tongue and erythema which covered the neck and thorax but was not noted in the folds of the body. His whole appearance strongly suggested scarlet fever. Twelve hours later the picture of scarlet fever had disappeared, the temperature assumed the remittent type, ranging from normal to 104° with a slow, full pulse averaging 85. Small submucous abscesses appeared on the margin of the palate and base of the uvula. The whole throat was grayish red. During the next two days these abscesses ruptured, leaving superficial ulcers and other ulcerated areas appeared upon the pillars and posterior pharyngeal wall. The temperature gradually declined to normal during the succeeding four days and the ulcers, excepting an area including the whole anterior aspect of the uvula, healed. The patient was discharged on the ninth day following admission.

Another case in this group has had considerable edema which has been largely confined to the epiglottis, glottis and trachea together with abscesses at the base of the tongue and in the false cords; also a diffuse board-like cellulitis in the neck which has reached the plane of the chin at times and is now located within the outlines of the thyroid gland and which has never softened. He has had a remittent temperature, characteristic slow pulse, no leukocytosis and several brief suffocating attacks due to edema. During two days the patient suffered a toxic delirium with a temperature not exceeding 101°.

The third class of cases—edematous inflammation—present the

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most striking pictures. The onset, excepting the congestion and swelling, is identical with group one. The fauces and pharynx are gray and edematous, the swelling of the tonsils is enormous and proceeds rapidly until the oral pharynx is completely shut off from the mouth, necessitating nasal feeding. The temperature does not exceed 101° and the pulse is somewhat more rapid than in the other groups. Toxic nephritis follows the onset shortly. This condition persists from three to eight days without glandular involvement and disappears as rapidly as it came. The prostration in this class is very severe.

The fourth class of cases—suppurative cellulitis—is identical in onset with group one and the signs may be any combination from group two and three. The suppurative areas may be localized in the throat, larynx, accessory sinuses or neck and may be followed by suppurative processes in any part of the body. The local epidemic has produced small suppurative areas in the fauces, larynx and neck, followed in two cases by purulent meningitis and peritonitis. One case has been complicated by empyema of the antrum of Highmore and frontal sinus.

Among the cases reviewed in this series the following conditions are noted:

18	cases	with simple septic throats.
3	"	" membranous septic throats.
3	"	" edematous septic throats.
3	"	" mixed edematus and membranous sore throats.
3	"	" suppurative cellulitis.
1	case	" ulceration of faucial and pharyngeal structures.
6	cases	" diffuse cervical cellulitis.
1	case	" discrete glandular enlargement.
1	"	" laryngeal abscess.
2	cases	" retrotonsillar abscesses.
1	case	" acute suppurative otitis media.
1	case	with mastoid involvement.
8	cases	" acute nephritis.
2	"	" delirium.
1	case	" meningismus.
1	"	" meningitis (purulent).
1	"	" purulent peritonitis.
1	"	" streptoccocus septicemia.
1	"	" board-like swelling confined to the thyroid gland.
3	cases	" moderate leukocytosis.
3	"	" pulse rate exceeding 100.
7	"	" remittent temperature lasting several days.
3	"	" unilateral involvement.

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The most striking features of all these cases are a comparatively slow, full pulse, which is out of any proportion to the fever, the almost invariable absence of leukocytosis, the frequency of a marked toxic nephritis, and the extensive cervical cellulitis which rarely suppurates.

The treatment consists in the use of saline cathartics, hot cleansing throat gargles, ice applications and polyvalent or autogenous vaccines. Nothing is to be gained by incision of the areas of cellulitis and the rapid supervention of suppuration seems to contraindicate this procedure. Patients should be isolated until more definite knowledge of the mode of conveying the disease is known.

DISCUSSION.

DOCTOR CLAUD T. UREN: I think the most striking thing about these cases of sore throat is the marked prostration. The prostration is more marked than, for instance, in quinsy or suppurative tonsillitis, where although the patient has a large abscess and there is difficulty in swallowing with severe pain, he does not show as marked a prostration as one sees in these cases.

The differential diagnosis between quinsy and the streptococcus throat is sometimes difficult, especially in the edematous variety, although the edema in these cases is usually of a slight amount in the pillars and more marked in the uvula and soft palate. In quinsy there is a bulging forward of the anterior pillars. The bulging is tense and usually fluctuates. The proper procedure in quinsy is to open and drain. It has been shown that incision of the tonsils or peritonsillar tissue in these epidemic throats simply aggravates the condition. This was shown especially in one case. The disease had been in progress for more than a week and was growing steadily worse. It looked as though there might be some pus about the tonsils in the peritonsillar tissue. A small opening was made and a drop of pus obtained. The patient's condition rapidly grew worse and the prostration was more marked. Furthermore, local applications, except for gargles, in these cases are not only absolutely useless, but often harmful. Silver nitrate, tannogen, et cetera, causes pus to collect in the deeper parts of the tonsils and there being no drainage from the crypts, absorption takes place in greater amount. There is so little to do for these patients that they oftentimes feel as though nothing was being done for them. Symptomatic treatment is all that is indicated. The pain should be relieved and sleep and rest procured by the use of soporifics. Cocain and adrenalin may be used intratracheally for the edema that occurs in some cases. If the edema is not relieved by intratracheal injection and the patient is in danger of suffocation surgical treatment is required.

One set of these tonsils was removed about ten days after the symptoms cleared up, but as yet we have not had a report on them. There were many adhesions about the tonsils, but whether these were

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due to this particular attack or to several attacks of tonsillitis one cannot say.

It will be interesting to know if there will be any sequelæ to these cases as there were to the epidemic of la grippe that passed over the country some time ago.

Doctor Luther F. Warren: The condition of septic sore throat seems worthy of discussion, for most of us have seen cases of this kind. In the last medical section there was a student who was attending five cases. There are various clinical forms, but all the cases I have seen have been of the edematous type. So marked was the edema that the whole throat filled up. Some of the throats showed a membrane, others showed crypts filled with pus and ulceration of the mucous membrane.

In two cases where I have made cultures from the throat, short chains of streptococci have been found. Some of these cultures show the streptococci in long chains and in pairs.

Doctor Ferris N. Smith: One point has occured to me during the discussion, namely, that most of the fatal cases have resulted from the simplest type of infection several days after the onset, and frequently several days after the apparent cure of the patient. A man has an attack of tonsillitis which apparently clears up, he feels better and resumes his work, the trouble recurs and proceeds to a fatal issue. In the discussion of the cardinal symptoms of these cases I did not consider the cases that progressed to a fatal termination or those that had general involvement. The pulse rises rapidly in cases of general sepsis. In all those cases which we have seen with a purely local process, the general symptoms are the result of toxemia; the pulse in only one case exceeded 100-114 with a temperature of 105°. Two hours later it was below 100°. In all of the cases we have noted a pulse which has been exceedingly slow and full and out of proportion to the temperature. The organism has been worked out rather definitely by Rosenberg, of Chicago, and he locates it between streptococcus pyogenes and streptococcus mucosus. In the Baltimore epidemic an attempt was made to show that it was a pneumococcus.

I would like particularly to report one other case, that of a student, who was sick for ten days and was brought to the hospital with an attack belonging in group one; there was a most marked cellulitis that made one think of mumps. The area of infiltration was on a line with the ear. The patient had remittent temperature for four days. Yesterday the throat was clear, but the cellulitis in the neck still persisted. One day the area of infiltration would be just above the clavicle and about two inches in diameter, while the tissues at the angle of the jaw and below would be perfectly normal; possibly the next day, the entire area of involvement would be shifted to include the whole of the neck to the median line but never crossed to the right side. The area has varied from the size of a marble to that of an orange and has involved the whole side of the neck.

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REPORTS OF CASES.

FRACTURE OF THE FRONTAL BONE, MUCOCELE OF BOTH FRONTAL SINUSES, PROBABLY TRAUMATIC; DOUBLE KILLIAN OPERATION; RECOVERY.

R. BISHOP CANFIELD, M. D.
Department of Otolaryngology.

History.—The patient comes to the University Hospital on account of swelling of the left eye and forehead. Nine months ago he was struck in the left frontal region by a baseball. The forehead swelled up and later the swelling disappeared showing depression over the left eyebrow. Some time later the swelling reappeared and remained for a couple of weeks and then disappeared. With this disappearance of the swelling the patient complained of a bad cold and discharge from the nose, although he does not associate the disappearance of the swelling with the discharge. About ten days ago the swelling reappeared and was lanced, considerable matter being evacuated. The patient has had no headache, no sense of sickness, no disturbance of equilibrium, loss of memory, no pain, that is, no subjective symptoms of involvement.

Examination.—This shows the left eyelid red and swollen and somewhat drooping. The line of incision is one-half inch below the centre of the eyebrow. The eye apparently is on a slightly lower level than the right eye. There is an area of considerable depression over the left eyebrow, especially marked over its middle third and extending well up on the forehead. This area is not sensitive to pressure. Examination of the nose shows hypertrophy of both inferior turbinates and both nostrils containing some pus.

An *x*-ray examination showed enormous frontal sinuses with moderate depression over the left frontal region, but was not particularly instructive. The operation had to be somewhat in the nature of an exploratory one. The *x*-ray proved of no value; all that was known was that there was a fracture of the anterior wall of the frontal bone.

Incision through the left eyebrow and retraction of the soft tissues upward revealed a depressed area in the left frontal region with an irregular, roughly stellate, slightly depressed fracture. Removal of the area of depressed bone showed an enormous frontal sinus filled with edematous and infected mucous membrane with some pus. Examination of the septum between the right and left frontal sinuses showed a defect through which a large quantity of mucopus escaped from the right side into the left frontal sinus. It became necessary to increase the incision to the right and to make a second one along the bridge of the nose upward three quarters of the way to the hair line in order to reach both frontal sinuses. These cavities extended from points well outside the lateral extremity of the eyebrows more or less straight upward almost to the hair line and followed the hair line to the median line. They extended very deeply backward over the orbit

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almost as far as the optic foramen laterally to a great distance over the orbit. The entire anterior wall, the inner frontal septum, the roofs of both orbits and the anterior half of the internal walls of both orbits were removed. The passages into the nose were then enlarged and the ethmoids curetted although not radically. The entire operating field was then smoothed up with the electric engine. On account of the patient's poor condition, removal of the middle turbinates and posterior ethmoid cells was not completed. Two wicks of gauze were inserted into the frontal ducts and drawn out through the nose, and long wicks of gauze were packed into the frontal sinuses and their ends drawn out through the external edges of the initial incision. Atropin was put into both eyes. During the operation the periorbita of the right eye was found adherent to the bone of the roof and internal wall of the orbit. In separating this the periorbita was slightly torn. The patient suffered considerably from shock and required saline transfusion and coffee and whiskey enema. Recovery from the anesthetic was slow.

This then completely obliterated the frontal sinus and anterior ethmoid. This offers the only method and technic that is successful in obliterating the frontal cavities and ethmoids—certainly the only one that permits such a radical operation without marked deformity. There is sure to be a certain amount of deformity with such large frontal cavities. If there is a marked depression it is remedied by the insertion subcutaneously of a wafer of paraffine of the proper size and shape.

I wish to call attention to the fact that although these cavities are very deep, and although they extend laterally to the malar bones and almost to the optic foramen they can be obliterated.

This case is demonstrated, first, to show the extent of the pathologic process, totally unsuspected before operation, and because it is one of the rare cases of involvement of the frontal sinus caused by anything except infection from the nose.

There is one point in the technic that I want to bring out that is interesting to the ophthalmologist, which developed in the course of the operation. If the pulley of the support of the superior oblique is removed nothing develops. Formerly we took care not to remove the bone to which the pulley is attached but now we find that if the pulley is preserved in its attachment to the periosteum the bone may be removed with no interference with the function of the muscle. No diplopia, no sense of discomfort, so far as the otologist can find, although the ophthalmologist may be able to see some change in the action of the muscles.

DISCUSSION.

Doctor George Slocum: This is a very interesting case. I saw the right eye this morning; the other eye was covered with the dressings, which were not removed. The swelling about the right eye was interesting; considerable palpebral edema was present but it was evident that no infection of the conjunctival culdesac had occurred for while

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there was marked lachrymation, there was practically no inflammatory discharge. Edema and chemosis of the conjunctiva were so pronounced that the conjunctiva had swollen between the lids and considerable abrasion of the conjunctival epithelium had been produced by the continual efforts of the patient to wipe away the tears which were flowing down over the cheek. So far as I could determine the edema about the eyes is associated with the accessory sinus condition and the reaction due to operative interference and not to any disease of the eye itself.

DEMONSTRATION OF THREE CASES OF PERNICIOUS ANEMIA.

JAMES H. AGNEW, M. D.
Department of Medicine.

Case I.—Any one of these cases might furnish material for a good clinical report. They all show the entire symptomatology of pernicious anemia. We generally have two or three cases of it in the Medical clinic, and we do not think anything particularly of it. Some other hospitals have three or four cases a year and think it quite remarkable. It is thought to be more common here. The general opinion is getting to be that pernicious anemia is more common where it is more carefully sought after, illustrating very well the value of routine blood examination. Perhaps that is one reason why we see so many of these cases here.

The first patient entered the University Hospital in March, 1911. He had been complaining for a couple of years of weakness, gradually increasing shortness of breath, and fleeting pains, particularly in the right thigh. His physical examination was practically negative with the exception that he exhibited slight loss of muscle sense in both great toes. The stomach examination showed achlorhydria, the urine was negative. The blood count disclosed 1,420,000 reds, and twenty-eight per cent hemoglobin. There were no marked gastrointestinal symptoms. He was discharged two months later, at which time he had 2,630,000 reds and fifty-eight per cent hemoglobin.

In December, 1911, he came back to the hospital and said that two months before he began to lose weight and had pain, particularly on the right side. At that time, he presented an anomalous picture of having a peripheral neuritis. His blood picture was practically negative and a diagnosis of pernicious anemia could not have been made. Of course, we had the blood findings of the time before which was perfectly definite. When he came to the hospital he had severe neuritis, confined particularly to the right sciatic region. He was transferred to the Neurologic clinic. Aside from some gastrointestinal complaints and some loss of weight previous to this he did not have anything except this neuritis which cleared up in about two weeks. He went home feeling well.

About a month ago he noticed his strength failing, although he had not been doing very heavy work. He had stomach disturbance,

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particularly after eating. Hydrochloric acid controlled these symptoms but they finally drove him back here. When he entered his hemoglobin was sixty per cent and a blood count showed 2,140,000 reds. Probably he was in one of the exacerbations of the disease and he was seriously ill. Until the 31st his blood count was down to 1,700,000 reds and forty-five per cent hemoglobin. The diarrhea has been very severe until today. This afternoon he said that he was beginning to feel a little better. Today his blood (1,730,000 reds, forty-four per cent hemoglobin) is practically the same as a week ago. There are no nucleated reds to be seen. The patient was very sullen, morose, and intractable and was finally discharged for profanity and insubordination.

This history is very characteristic in this respect, that after a period of severe diarrhea the symptoms clear up. Whether or not it is the elimination of the hypothetical toxin is not known. But after an unusually severe diarrhea the condition often improves. In fact, a severe and thorough purge is one method of treatment.

Case II.—This patient is fifty years of age. His physical examination is negative except for extreme paleness. Instead of the subcutaneous fat being well preserved; he is emaciated. In most cases there is a peculiar yellow color from the subcutaneous fat showing through the skin. In this case the pallor has come through. He has been told that he had a blood ailment. There was nothing significant in his history except that about eight years ago he had yearly crops of boils on the neck over a period of five years. During this time he lost twenty pounds and complained of sore mouth, numbness and tingling in the feet. He has a history of chronic constipation and for the past two months has had gastric symptoms. These are nothing more than distress after eating and eructations of gas with a feeling of fulness in the epigastrium.

The blood count is especially interesting. He had 1,225,000 reds and twenty-three per cent hemoglobin. He exhibited a number of nucleated reds, seven while counting three hundred whites. His count, as far as the relative number of reds and hemoglobin is concerned, remained practically the same while here, slightly below 1,000,000 and twenty-seven per cent. The patient has had a most remarkable megaloblastic shower. On one occasion he had a count of 22,700 whites, while before that he had been having white counts of 5,300 and 5,400. The explanation was that many nucleated reds were present which were also counted as whites since they cannot be differentiated in the usual diluent. In fact so many nucleated reds were present on one occasion that while counting four hundred white cells, five hundred and thirty-eight nucleated reds were seen, of which four hundred and seventy-seven were megaloblasts in all stages. Beautiful mitotic cell division figures were abundant.

The particularly interesting feature in this case was this marked megaloblastic shower. Ten days later more than two spreads were

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examined before a nucleated red could be found, showing that the shower was past. Such a shower often inaugurates a remission, although death may occur during or immediately following it. This patient appears to be improving.

Case III.—This patient has been in the clinic off and on since 1904 and has attracted considerable public interest and at the present time he is likely to attract still more. He has some very interesting findings. Unfortunately he has taken French leave. He first entered in 1904 complaining of pains, particularly about the chest and intercostal neuralgia; also he had prolonged and severe diarrhea over the previous two years. The probable duration of his ailment exceeds ten years. His physical findings at the time of his first entrance were practically negative. The only count reported in August, 1904, shows 4,320,000 reds and one hundred per cent hemoglobin. There is no note of the findings on a stained smear. He had an achlorhydria at that time, and it is interesting to know that the diagnosis was made at that time, presumably by Doctor Dock. When you consider that the blood did not show anything else the diagnosis of "chronic diarrhea and achlorhydria" only was possible.

He entered again in 1906. In the meantime he had been unable to work and came back complaining of gastrointestinal symptoms, paresthesia, numbness and tingling, and difficulty in walking. He showed an achlorhydria as before and the blood picture first indicated pernicious anemia. His red count was 3,000,000 and the hemoglobin was estimated at fifty-nine per cent. On his discharge one and one-half months later 4,400,000 reds and eighty-six per cent hemoglobin were reported and a definite diagnosis of pernicious anemia was made.

He was seen next in March, 1907, complaining of difficulty in walking. He showed no anemia. In May, 1907, he showed 5,300,000 reds.

He came again in 1909 after working on a farm. His blood indicated very little anemia, namely, 3,000,000 reds and eighty-six per cent hemoglobin. About this time he began to come before the public eye. He had become very quarrelsome, was unable to do anything and his wife was obliged to support the family. He appealed to the county officials and became a serious social and political problem. He demanded that he be supported and thus attracted considerable public interest and a great deal of newspaper notoriety. "It is possible that he is shamming" appeared as headlines. It was only after letters by Doctor Van Zwaluwenburg and by Doctor Hewlett were published that the matter was adjusted. Since that time he has been partially supported by the county, although his wife works constantly. I have seen him a couple of times since 1909 and each time he had very little anemia, 3,000,000 reds and seventy-five per cent hemoglobin. In March, 1910, he had 4,000,000 reds and in January, 1912, 3,100,000 reds. There were very few cell changes in the picture.

This last time he entered for protection. He showed many psychopathic tendencies, was quarrelsome with his neighbors and it was

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hard for his wife to get along with him. She was obliged to have him arrested for cruelty and abuse. His latest offense was against a neighbor. He was constipated and was having trouble in taking an enema. He took the rectal tube to his neighbor's wife to get help, engaged in an altercation and slapped the woman's face, whereupon she sent for an officer. Patient escaped to the hospital and the officers inquired, saying they would be down the next day. He does not live far from here and just why he decamped I do not know.

He presents the end stages of a pernicious anemia, the toxin acting particularly upon the nervous system, including the cerebrum. He walks with an ataxic gate and at the same time is quite spastic. His patellar reflexes are exaggerated. His tactile and muscle sense are very much disturbed in all extremities. As far as the psychopathic processes are concerned they are evident from his recent actions. One would at least designate him as a "peculiar" man.

These cases really illustrate the symptomatology of pernicious anemia. This disease is twice as common in men as in women. We have here three men whose ages are fifty-five, thirty-nine and forty-seven. Pernicious anemia is six times more common above the age of thirty-five than under it. The symptomatology in these three cases includes gastrointestinal disturbances, nausea, vomiting, general feeling of distress, weakness and loss of weight. Cord changes characterized by paresthesia and numbness leading to posterior lateral sclerosis, sometimes involving the higher centers. Marked remission is seen in only one of the cases reported.

DISCUSSION.

DOCTOR LUTHER F. WARREN: It is interesting to know that pernicious anemia is considered a rare disease in many parts of this country, while in this clinic we see many cases each year. It was once said that pernicious anemia was not recognized in the East until Dock's pupils found it in the hospitals. Whether this is true I do not know. The crises in pernicious anemia usually come when the patient is at his last ebb. If the patient has three megaloblastic showers he usually improves or appears cured.

AN EARLY CASE OF GENERAL PARALYSIS.

ROBERT H. HASKELL, M. D.
Department of Psychiatry.

The patient, whom I shall present to you is a man, twenty-eight years old, married, at present an automobile assembler but previously in the navy. His family history is negative save for syphilis contracted in Italy eight years ago for which he had no treatment. His wife has never been pregnant. In November, 1911, he consulted a well known firm of quacks in Detroit because of dilated veins in various parts of his body which were said to be the signs of syphilis and for which they treated him by hypodermic injections and pills.

The first thing abnormal noticed by his wife was that about two

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weeks before his admission to the hospital he was quieter than usual on coming home at night and acted as if something were on his mind. Pressed for an answer he would say, "Things aren't going right at the shop." On the 13th he acted as if his limbs were a little stiff. The next day he was somewhat dizzy in the morning. That night after his day's work he did the chores as usual and worked for an hour or so on the roof of their little home. When supper was ready he came into the house with the following remark: "Why have you got all these things out for everyone to look at?" His wife seeing how red he was in the face and the queer look in his eyes placed a chair for him, where he sat unable to walk or move for two hours. There were no convulsive movements noted. At the end of this time he began to talk in a paraphasic manner and walked through the house not knowing his wife or where he was. He continued this motor restlessness through the night. He slept all next day. The following day he had confused plans of rearranging things and attempted to destroy parts of the house with an axe. The movements of both arms were noted to be ataxic. He would get up from his bed to go to the toilet and being unable to find it would soil the floor; or being taken there he could not find his way back to bed. He vomited several times Thursday. Friday while being taken for a walk he would greet strangers as old friends of his boyhood days. That night he fought imaginary flies in the room and heard and saw strangers in the adjoining room. The next afternoon he went down town again and ordered a large amount of lumber for an addition to his home. Sunday he vomited several times, since when he has slept most of the time. He still does not remember the home surroundings or his wife but does recognize his mother and talks as if they were in his old home in an adjoining state. Such was the history furnished by his wife.

The patient came to the Psychiatric Hospital May 23, nine days after his attack. He looked happy and laughed sillily at everything said to him. In less than an hour after admission he had forgotten his ride on the railroad train from Detroit and said that he was in his own home in Sandusky. He did not feel sick and never had been. The physician was an old acquaintance. He gave correctly the day and month but did not know the date or the year. He said that he had just been married this spring and had one child about a year old. He tried to pick some imaginary apples from a chair and hunted through the bed clothes for his coat. He would not remain in bed but walked up and down the room fingering the walls, the door and the bed and though in his night shirt would keep trying to put his hands into his trousers pockets. He continued this way for a week, entirely disoriented, unable to remember names or numbers given to him; willing to obey simple requests but unable to carry them out because of inability to remember them that long. Sometimes he was in a barracks, sometimes in his old home; sometimes in a summer boarding house. He could not tell important dates such as the year of his marriage. Shortly after breakfast he described his last meal as dinner. Given the problem 9x7 he answered cor-

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rectly; immediately given 7x9 he could not perform it. He had usually come here that day and though he recognized the physicians, he had no idea of their occupations and knew them from meeting them down town frequently. He would be tired in the morning because he had been out bumming the night before. He had a very definite speech defect. His handwriting was tremulous and showed extra strokes and reduplicated syllables.

Physically he was practically negative beyond his enormous bulk of two hundred sixty-seven pounds. His blood pressure registered 135. Neurologically the pupils were slightly irregular in outline; equal; both reacted somewhat sluggishly to light, the left more so than the right. There was no ptosis; no extraocular palsies. He noted differences in the solutions for testing taste and smell but could not name them. His hearing was slightly impaired. There was a generalized hypalgesia. The knee-jerks were both slightly increased, the left more so than the right. There was no Babinski. The facial muscles on the right side of the mouth were weakened. There was a fine tremor on facial movements. The tongue went a little to the right and had a fine tremor.

Station was good; gait lumbering; no Romberg. Handgrasps were 36-38. His urine showed a few granular casts. The C. S. F. flowed in a stream: 115 cells to the cubic millimeter; Nonne-Apelt 5+; Esbach 5; Wassermann very positive. Fundus examination showed a slight perivasculitis in either eye but no lesion.

Today the patient presents a remarkable improvement. He is clear about his life up to the time of his attack. He tells of a failing memory for the past few months, of his work falling off in its quality, of several dizzy spells and of at least one time when he could not talk for several minutes. However, he does not remember anything from that time up to the lumbar puncture here, a period of fourteen days. He cannot give the names of anyone around him and as you see fails to recognize one of his physicians. A few days ago he was given a cutaneous injection of luetin but on the following day, though the injection was slightly painful at the time, he remembered nothing of it. His speech defect has practically disappeared. His handwriting shows none of the extra strokes and reduplicated syllables. He is anxious to help with the work and does it well. He realizes that he has been sick but is distinctly euphoric.

The important question in this case is: Has the patient general paralysis or cerebral syphilis? The history of the onset will apply to either. The method of the attack might belong to either. There were no definite focal symptoms observed; the increased knee-jerks and the facial weakness could be found in either, though in cerebral syphilis it is very doubtful whether such isolated signs alone would appear. The time limit of eight years since his primary infection would be in favor of cerebral syphilis though not excluding general paralysis. The positive Wassermann is definitely, though not absolutely, against cerebral

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syphilis. The mental picture, however, of such profound disorientation, memory disturbances, impaired judgment, prolonged confusion, distinct euphoria, with the speech defect, writing disturbances, slightly impaired pupils and the strong Wassermann on the fluid make definitely for general paralysis. It would be impossible to state the exact type at this time. His improvement has been marked, and probably will continue to a certain extent. If it be general paralysis we shall expect within a fairly short time another attack with increasing deterioration. He does, however, merit rigid treatment: it will do no harm. It will be interesting to watch the course of the disease.

DISCUSSION.

DOCTOR CHARLES R. LOWE: From the patient's symptoms alone at the present time I do not think one could say he is suffering from general paresis. With the exception of a slight euphoria he has none of the usual symptoms, but his history and his symptoms when he entered the hospital were more typical of the disease and I think the diagnosis is correct.

A brain tumor was considered but the positive Wassermann reaction would make one think that if it be a tumor it is due to syphilis. Still the mere presence of syphilis does not rule out some other form of psychosis in a syphilitic individual. This case seems more likely to be general paresis than any other classified psychosis. Yet the man may be suffering from some form of cerebral syphilis.

The important point lies in the prognosis. If he is suffering from general paresis the prognosis is bad; if from cerebral syphilis treatment should be of some value. If one be in doubt the therapeutic test could be tried. If the trouble is general paresis, treatment would do no harm, and, if syphilis, it might do some good. However, improvement for a time would prove nothing as this man has improved markedly with no drug treatment. His improvement began shortly after he was punctured but one cannot say whether the puncture had anything to do with the improvement.

DOCTOR HASKELL (closing): The luetin test is a skin reaction comparable to the tuberculin reaction devised by Noguchi. A dead culture of spirochetes is injected intradermally. Even in normal individuals there is a primary reaction shown by slight redness and papule formation which disappears by the end of two or three days. In positive reactions at the end of this time there is an extension of the reaction; a definite papule, sometimes a pustule, and a considerable area of redness extending from this. The reaction is stated to be definite only in treated cases of secondary and in tertiary syphilis and not of great value in primary or parasyphilitic conditions.

In this case the luetin was injected two or three days ago and shows slight redness. All the patients injected so far have shown considerable primary reaction but I do not think that he showed anything very definite. The consensus of opinion is that salvarsan is the best therapeutic agent that we have for cerebral syphilis but from the nature of the pathologic processes in general paralysis we cannot expect any improvement here from salvarsan.

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TRANSACTIONS
OF THE
CLINICAL SOCIETY
OF THE
UNIVERSITY OF MICHIGAN

STATED MEETING, JULY 3, 1912.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.
REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS

THE EARLY DIAGNOSIS OF CANCER OF THE UTERUS, BASED ON A STUDY OF TWO HUNDRED TWELVE CASES.

GEORGE KAMPERMAN, M. D.
INSTRUCTOR IN OBSTETRICS AND GYNECOLOGY IN THE UNIVERSITY OF MICHIGAN.
ANN ARBOR, MICHIGAN.

THE cause of cancer belongs to that large group of unsolved problems which has baffled medical science in every attempt to find a solution. The interest in the problem does not exist because cancer is a new disease, since this disease is as old as the world; but the high mortality, the terrible nature of the disease, the almost uniformly bad prognosis in the past, its increasing frequency, its unsolved etiology, —these factors have been sufficient to keep the question continually before the medical profession.

As long as the cause of cancer is unknown, prophylaxis or treatment cannot be said to follow along rational lines. But while laboratory workers and clinicians are endeavoring to ascertain the cause of the disease, patients with cancer are presenting themselves for treatment, and must be helped if possible, whether the treatment be rational or not. Each specialty has done its share towards the solution of the problem as far as its limited field is concerned, but in no instance has the solution been reached. Thus it has fallen to the lot of the gynecologist to help solve the question of uterine cancer. The high percentage of mortality and the low percentage of cures testify to the reality of this unsolved problem.

Although cancer seems in some respects to be a disease of certain

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localities, no part of the world is entirely free from it. Like other diseases, cancer becomes more frequent the more diligently it is looked for and the more carefully diagnoses are made. Although certain races seem less susceptible, no race is entirely immune. Not only is cancer prevalent everywhere, but it is actually on the increase. In many countries this disease is becoming one of the great mortality producers, usually being found near the top of the mortality lists. While the frequency of the disease has increased, the percentage of cures in most instances has not improved. However, some progress has been made, the Germans in particular having done good work, for with them the percentage of cures has gradually increased.

In Michigan cancer is among the more common causes of death. The vital statistics compiled by the Department of State show that this disease is near the top of the mortality list. During the five-year period ending December 31, 1909, the mortality due to cancer was over nine thousand. Only four other diseases* caused a higher mortality. The statistics are rather incomplete, however, and it is impossible to determine anything definite concerning uterine carcinoma, since the Department of State does not compile separate statistics on uterine cancer, but includes in one group all genital carcinomas.

* Heart disease, tuberculosis, pneumonia, enteritis (infantile).

A comparison of the Michigan mortality statistics for tuberculosis and cancer shows some interesting facts. The mortality due to tuberculosis is only slightly higher than that due to carcinoma. During the five years ending December 31, 1909, there has been a slight (three and seven-tenths per cent) but gradual decrease in the mortality due to tuberculosis. On the contrary, the mortality due to carcinoma has increased, not gradually, but at a very rapid rate,—the increase during this time being fifteen per cent. Although we are constantly reminded of the great increase of and danger from tuberculosis, we very seldom hear a similar word of warning concerning carcinoma. Furthermore, because of neglect or ignorance, the great majority of cases of carcinoma are incurable. It would seem that a disease which has so uniformly doomed its victims in the past, but which is curable in certain stages, should be given more public thought and attention than it has received.

Cancer seems to be more frequent in southern Michigan than in the northern part of the state. In fact the number of cases of cancer per thousand population gradually increases as one goes from northern Michigan to the extreme southern counties. In this respect the statistics are just the opposite of those for tuberculosis, where the smaller number of cases per thousand population are found in the southern counties, and the rate gradually increases as one goes north, and is greatest in the upper peninsula. Several explanations have been offered, but none is very satisfactory. The question of race or nationality will largely explain the distribution of tuberculosis. It has been suggested that cancer is a disease of civilization, and possibly this

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explains its increased frequency in the more thickly settled portions of the State. However, no definite proof of this has been presented.

As stated before, we have no means of determining the exact frequency of carcinoma of the uterus in this State. We can, however, get some idea as to its relative frequency as compared with other gynecologic diseases. During the last ten years about five thousand three hundred patients applied for treatment in the University of Michigan Gynecologic clinic and in the Private Hospital of Doctor Reuben Peterson, and practically all suffered from gynecologic complaints. Of these patients, two hundred twelve had some form of uterine carcinoma. From these statistics alone it would be fair to conclude that about one in every twenty-five gynecologic patients has carcinoma of the uterus,—a percentage of four. Just what proportion of the entire female population is afflicted with uterine carcinoma it is impossible to state.

Clinically, uterine carcinoma can be classified into two groups,—(1) carcinoma of the cervix and (2) carcinoma of the fundus. These are distinct clinical varieties, and as they differ so much in prognosis and in treatment the distinction should always be borne in mind. Carcinoma of the cervix is more frequent, occurring one hundred seventy-six times in two hundred twelve cases (eighty-three per cent), while carcinoma of the fundus occurred only about thirty-six times, or in about sixteen per cent of all cases.

Clinically, carcinoma of the cervix may occur in various forms, the picture in most cases depending on the stage of the disease. One form which unfortunately does not cause enough symptoms to alarm the patient, and for that reason is not often recognized, shows a hard, thickened, indurated, friable cervix, but without much destruction of tissue. This picture represents the earliest form of the disease. Another form is the proliferating variety where the cancer juts out from the cervix and extends into the vagina, which it may entirely fill. This tumor is usually spoken of as a "cauliflower" growth, a term in every way fitting. A third clinical form presents an excavated cervix, with marked destruction of tissue. Often the cervical rim is entirely destroyed, merely an excavation marking the former site of the cervix. Without doubt many of the cauliflower growths at a later stage, when degeneration has occurred, would show this "crater" form.

The clinical or gross picture of carcinoma of the fundus is usually that of a fungous growth replacing the endometrium. At times the entire endometrium may be involved. Rarely the fungous growth is attached over a small area only, somewhat like a polyp.

Microscopically there are also various forms of carcinoma of the uterus. Carcinoma is an epithelial growth, and as the uterine fundus contains only one kind of epithelium, we have here only one type of carcinoma. It arises from the epithelium of the endometrial glands, and proliferates by forming gland-like extensions. This form is known as "adenocarcinoma" of the fundus or endometrium. In the

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cervix we find two kinds of epithelium, stratified squamous epithelium covering the portio vaginalis, and tall columnar cells lining the cervical canal and its glands. These columnar cells may be affected by carcinoma, with resulting proliferation similar to carcinoma of the fundus, producing an adenocarcinoma of the cervix, extremely malignant, but fortunately very rare. The more common form of cervical carcinoma arises from the stratified squamous epithelium, and is known as "squamous-celled" carcinoma. In certain cases these tumors seem to proliferate from the deeper or basal layers of the ephithelium, rather than from the flattened squamous cells. This form is spoken of as "basal-celled" carcinoma. These two forms arise in the same tissue, all authors not recognizing the distinction, which is microscopic and dependent on the form of the cells constituting the neoplasm.

As a basis for this paper, a study has been made of two hundred twelve cases of cancer of the uterus treated in the two clinics mentioned above. These cases have been compiled and a study made of the relation of carcinoma to age, menopause, parity, heredity, et cetera.

In the present series of cases the age at which the carcinoma developed could be definitely determined in two hundred eleven cases. The average age for the whole series was forty-eight years. However, the age limit is wide, the youngest patient being twenty-six, and the oldest seventy-five years of age.

A separate classification was made of the cervix and fundus cases. The age could be determined in one hundred seventy-five cases of cancer of the cervix. The youngest patient was thirty-one years of age and the oldest sixty-nine years. The average age was forty-seven and two-tenths years.

TABLE I.—AGE STATISTICS; CARCINOMA OF CERVIX.

Ages	34	35–44	45–54	55–64	65–74
Number of cases	17	59	59	34	6
Percentage in each decade	10	33	33	20	3

As shown in Table I the number of cases at either extreme of this age limit is small. Two-thirds of the cases occur in the two decades between thirty-five and fifty-five years of age. It is not quite so common in later life.

The age was determined in all the thirty-six cases of carcinoma of the fundus. As shown in Table II the disease may occur at almost any age, the youngest patient being twenty-six and the oldest seventy-five years old. The average age is fifty-two years, this being five years older than the average in cancer of the cervix. The decades beginning with thirty-five, forty-five and fifty-five years of age each furnish about the same number of cases. The majority of these (fifty-seven per cent) occur between forty-five and sixty-five years of age, which is a later period than the majority in cancer of the cervix. It cannot be said that adenocarcinoma of the fundus is more common in later than in earlier life. In fact, in this series it is more common in

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patients between thirty-five and forty-five than in those between sixty-five and seventy-five years of age. It would be more correct to say that adenocarcinoma of the fundus develops through a longer range of years than carcinoma of the cervix. More patients of advanced years are afflicted with it than with carcinoma of the cervix, and this raises the average age. But it is wrong to assume that younger patients are not subject to this form of carcinoma. The number of cases of carcinoma of the fundus is distributed quite evenly between thirty-five and sixty-five years of age.

TABLE II.—AGE STATISTICS; CARCINOMA OF FUNDUS.

Ages	34	35–44	45–54	55–64	65–75
Number of cases	1	9	10	11	5
Percentage in each decade	3	25	27	30	14

The relation of childbearing to cancer of the uterus has been frequently discussed. In the series of two hundred twelve cases, twenty-three had never given birth to a full term child, although four of them had had early abortions. This means that one hundred eighty-nine patients, or eighty-nine per cent of the series, had been delivered of full-term children. Statistics like these have given support to the opinion that the trauma of labor stands in some etiologic relation to carcinoma of the uterus.

Of the one hundred seventy-six patients with cancer of the cervix, one hundred sixty-three or ninety-three per cent had had children. It will be noted that the percentage of patients without children is considerably larger in patients with cancer of the fundus (twenty-seven and seven-tenths per cent) than in patients with cancer of the cervix (seven per cent). From this alone it may be assumed that childbearing does not stand in such close relationship to carcinoma of the fundus as it does to carcinoma of the cervix. The question of sterility should be considered in this connection. Of the thirteen nulliparæ among patients with cervical cancer, nine had been married over a long period of years without becoming pregnant. Of the other four nulliparæ three had had miscarriages and one had married late in life. Of the ten nulliparæ among the patients with cancer of the fundus, three were married for a long time without becoming pregnant, four were single, two had had miscarriages, and one had married after the menopause.

TABLE III.—PARITY-CANCER.

	CARCINOMA OF UTERUS.	CARCINOMA OF CERVIX.	CARCINOMA OF FUNDUS.
Number of cases	212	176	36
Number without children	23	13	10
Percentage, no children	11	8	27.7

The above statistics show that undoubtedly carcinoma is more likely to occur after childbirth, and this is especially true of carcinoma of the cervix. But it is also very evident that carcinoma of both the fundus and the cervix may develop in women who have never given birth to children or who have never been pregnant.

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From the patient's viewpoint the menopause or change of life means a cessation of the menstrual flow. Although an important incident, we know that the cessation of menstruation is only one of the phenomena of the menopause. Often we see patients who have the nervous and other manifestations of the climacteric but still have a bloody discharge, not infrequently due to disease. Such patients do not consider they have had the change of life. In this series of cases, we will, however, consider the cessation of menstruation as the criterion of the established menopause. Information concerning the menopause was obtained in two hundred eight cases. It was found that the disease had started before the menopause in one hundred twenty-six cases (sixty per cent). In the remaining eighty-two patients the carcinoma first produced symptoms after there had been a definite cessation of the menstruation due to the menopause.

TABLE IV.

Menopause not Begun.	Postmenopause.			
	1-5 years.	6-10 years.	11-15 years.	16-20 years.
All cases, 208.				
126 (60%)	24	22	22	14
Cervix cases, 172.				
110	19	17	17	9
Fundus cases, 36.				
16 (44%)	5	5	5	5

This is a very important point to consider as it affects directly the problem of early diagnosis. The patient has a very indefinite idea as to what the change of life means, and any menstrual irregularity, whether it be a decrease or an increase in the flow is ascribed to the change in life. Table IV shows that sixty per cent of the patients with carcinoma of the cervix do not have the cessation of menstruation due to the menopause. The disease develops and keeps up some bloody discharge at the time when the menopause should occur with the patient blissfully ignorant of the true state of affairs. It is not until there is a constitutional breakdown that the patient gives the matter any serious attention. In the forty per cent of cases where the symptoms begin after a definite amenorrhea due to the menopause, the patient is more likely to be alarmed and relief is sought at an earlier stage.

It will be seen from Table IV that more cases of cancer of the cervix (sixty-four per cent) begin before the menopause than do cases of cancer of the fundus (forty-four and four-tenths per cent). This is due to the fact that more cases of cancer of the fundus begin late in life.

The majority of all cases of carcinoma of the uterus are inoperable when the patients apply for relief. The operability depends on the extent of the involvement. The duration of the disease is not an exact criterion, although it is in a general way. Patients who have had symptoms for a year or two are usually beyond surgical relief. Occasionally, however, a slow growing carcinoma may be operable even after a longer period. The operability must be determined by bimanual

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examination. If the cervix is firmly fixed in the pelvis and the fundus and appendages cannot be felt because of the induration of the vaginal vault, a curative operation is out of the question. If, however, the local disease is limited to the cervix, and the vagina is free, and the uterus is freely movable,—then the patient still has a chance for a cure. In such a case an exploratory operation is always advisable.

In carcinoma of the fundus there may at times be considerable involvement of the endometrium with marked enlargement of the uterus, still the case be distinctly operable. This variety of carcinoma is usually of slow growth. The movability of the uterus will determine the operability. In advanced cases where the uterus is fixed and ascites has developed, operation is out of the question.

In trying to make a classification of cases according to the clinical picture presented, one hundred fifty-eight cases were available for classification. The three stages before mentioned were recognized. Thirty patients showed the enlarged, thickened, indurated and friable cervix without much loss of tissue, and were considered favorable cases for operation. In eighty-seven patients the carcinomatous crater or excavation was seen. The cauliflower mass was observed in forty-one cases. It will be noticed that the most common clinical picture is the excavated cervix or vaginal vault, and unfortunately this represents the more advanced stage of the disease. Of the two hundred twelve cases, fifty-three cases or twenty-five per cent, were considered operable and were subjected to the radical abdominal operation. The remaining seventy-five per cent were beyond cure, and only palliative operations could be performed.

A great difference of opinion exists as to the influence of heredity in the development of cancer of the uterus. W. Roger Williams has collected statistics on this subject and found that there is a family history of cancer in nineteen and seven-tenths per cent of all patients with cancer of the uterus. The percentage is slightly higher in patients with cancer of the breast. In his entire series of female patients, there was a history of heredity in twenty-two and four-tenths per cent of all cases. In a series of one hundred one women with nonmalignant tumors the same writer finds a family history of cancer in fifteen and eight-tenths per cent of the families. This slight difference, he presumes is evidence of the hereditability of cancer. Cullen, in a series of seventy-four cases of cancer of the uterus found a family history in about nineteen per cent, and concludes that heredity plays a minor rôle in the development of cancer of the uterus.

In the series under consideration there was a definite record as to the family history in one hundred ninety-two cases. Of these twenty-nine showed a family history of carcinoma,—a percentage of about sixteen. For the purpose of comparison, the family histories of one hundred gynecologic patients free from malignancy were investigated. In this series, taken consecutively, twenty-two per cent of the cases showed a family history of cancer. The fact that in patients

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with carcinoma the percentage of those with family histories of malignant disease was less than in gynecologic patients without carcinoma, certainly would not support the theory that cancer of the uterus, at least, is hereditary.

The symptomatology of uterine carcinoma is fairly distinctive in most instances. In one hundred ninety-four cases in this series, there was a definite record as to the earliest symptoms and the course of the disease. In one hundred forty-two cases, or seventy-three per cent, the earliest evidence of the disease was the occurrence of a bloody vaginal discharge. The nature of this bleeding varied a great deal, and almost every type of hemorrhage was recorded. In many instances it first appeared as an increase of, or a prolongation of the normal menstrual discharge. Patients with a period of four days duration had a gradual lengthening of the period up to ten or fourteen days. In many cases the flow was continuous, the patient losing all track of her normal periods. In nearly all cases an intermenstrual bloody discharge appeared early in the disease. In most cases this was very slight amounting in many instances to nothing more than an occasional stain. But even in these cases where the amount of blood lost was small, the flow was frequent and easily produced. It was not uncommon for a slight bloody discharge to appear after coitus or after the use of a vaginal douche. Likewise any exertion or jarring would give rise to a stain or blood on the napkin. In several patients this show of blood appeared during or after straining at stool.

But as mentioned before there was a great variation in these types of bleeding. In a few patients the first evidence of something wrong was a sudden gush of blood from the vagina. In a few where this occurred, there were no further symptoms for a considerable length of time. In others the bleeding was continuous and severe and in a very short time caused a marked secondary anemia.

The bloody discharge was followed in most cases by a watery discharge which often contained bits of necrotic tissue. In nearly all cases where enough time had elapsed since the beginning of the bloody discharge a foul, watery discharge, due to the presence of necrotic uterine tissue appeared. It seemed to come earlier in cases where the hemorrhage started profusely. The discharge very often at first was clear, watery and odorless but after secondary infection occurred it became foul and thick in consistency.

In most cases pain was a late symptom, and occurred in advanced cases. The type of pain varied a great deal, some patients complaining of a bearing down pain in the abdomen and others simply of a suprapubic tenderness. Many patients had a very intense sacral backache. Pain radiating to the hip and down the thigh was also very frequent. The pain in most cases was very severe, often of a "grinding" or "boring" character rather than sharp. Although the pain occurred at all times, more frequently it began towards evening and lasted well into the night. In some of the advanced cases drugs were powerless to control the pain.

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In forty-one cases the first symptom observed was a leukorrheal discharge. In these cases there usually was no profuse hemorrhage, although the discharge later showed some color, or became blood-streaked. A few patients asserted that they had never had any abnormal bloody discharge.

As stated before, pain is a late symptom of uterine cancer. Eleven patients, however, gave pain as their first symptom. Pain may occur early, but in such cases it is always a question whether it may not be caused by some lesion other than carcinoma.

It is impossible to differentiate between carcinoma of the cervix and carcinoma of the fundus from symptoms alone. It has been said that a clear, watery discharge is characteristic of carcinoma of the fundus, but in these cases no such distinction could be made. Only by a pelvic examination could one differentiate the cases. A striking difference, however, was the fact that in carcinoma of the fundus local symptoms existed for a much longer time than in cervical carcinoma without producing constitutional effects.

The rather infrequent occurrence of cachexia in these cases is worthy of note. It emphasizes the fact that cachexia and loss of weight are not only not essential to carcinoma of the uterus but that one must not wait for their development to make a diagnosis. It is not uncommon for patients to say that they are even gaining in weight. Many patients put on flesh at about the menopause, and one must not take this as an assurance that no malignant disease exists. If the patient's freedom from disease be judged by her flesh alone, valuable time may be lost before the true diagnosis be made. In fact excessive flesh is a distinct disadvantage to patients with carcinoma of the uterus since it may be enough to turn the scale in favor of a mere palliative operation in a border-line case, where in the case of a thin patient, the radical operation would have been attempted with some hope of success.

The treatment of carcinoma of the uterus may be divided into (1) curative and (2) palliative. When the cause of cancer is discovered we may be able to cure more patients. Until then we have no alternative but the knife. When another method of cure is discovered, no matter what it is, the gynecologic surgeon will only be too glad to turn over these patients to the cancer specialist.

Of the two hundred twelve cases, fifty-three or exactly twenty-five per cent were subjected to the radical abdominal operation. This does not mean that the surgeon was confident of an absolute cure in each case. It signifies, considering the extent of the disease, that each case was thought worthy of the trial.

The radical abdominal operation for carcinoma of the uterus consists of the complete removal of the uterus and the parametrium with a cuff of the vagina, together with both tubes and ovaries. The operation also includes the removal of enlarged pelvic glands whenever this can be done without too seriously endangering the life of the

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patient. The operation is a serious one, and is distinctly an operation for the specialist. A mortality of about twenty-five per cent among these fifty-three cases testifies to the severity of the undertaking. However, with a goodly number of patients alive and free from recurrence from five to nine years after the operation and with other patients living who promise to do equally well or better, one feels encouraged even though the undertaking is desperate. The operation gives the patient her only chance for a complete cure, and for this reason the opportunity must not be denied her if there be a chance for success.

The results of the treatment of carcinoma of the fundus are somewhat more hopeful than that of carcinoma of the cervix. In most cases the disease advances slowly with the result that only late in the disease are the lymphatics involved. The ordinary panhysterectomy will give good results in nearly all cases.

Three-fourths of the two hundred twelve cases were so far advanced as to contraindicate the radical operation. Hence the treatment employed was necessarily only palliative. When a patient presents herself for treatment with gradually decreasing strength from continual bleeding; is a nuisance to herself and friends; when she is weak, anemic. and septic; when there is loss of appetite and numerous other complaints,—it is remarkable how well she will respond to palliative treatment. A short period of rest in bed, with good food and some form of iron will usually bring up the hemoglobin very rapidly. Then when it is safe to give an anesthetic, the necrotic, infected, carcinomatous growth should be curetted away. The actual cautery can here be used to good advantage. The application of a strong corrosive, for example, gauze soaked in fifty or seventy-five per cent zinc chloride solution will usually result in a slough of the necrotic tissue and leave a clean granulating surface. The bleeding will then stop for a while and the discharge will disappear. Septic absorption will cease, the patient's color will improve, her appetite will return, she will be relieved temporarily of her pain, and in all respects will be much improved. Of course the improvement is only temporary and soon or late her old symptoms will return because only a portion of the diseased tissue has been removed.

The duration of the disease varies with the different types of carcinoma. In general, patients with cancer of the fundus live much longer than those with cancer of the cervix. It is not uncommon for the former type of patients to live four or five years. On the other hand the cases in this series with cancer of the cervix very seldom lived beyond three years, and it was more common to see a fatal end after about two years. A few unusual cases may be mentioned; one a patient with basal-celled carcinoma of the cervix who, first appearing in the clinic fifteen years ago, has returned several times since. She returned last two years ago, and when heard from a year ago was still alive. Another patient who entered the clinic eight years ago

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with an inoperable squamous-celled carcinoma of the cervix was still alive and fairly well two years ago. Naturally these cases are exceptions to the general rule.

Since only comparatively few patients with inoperable carcinoma died in the hospital the records are naturally very incomplete as regards the cause of death. Although the date of death is recorded in some instances the terminal cause is not given. Judging from the somewhat meager records in this respect it would seem that patients with cancer of the uterus who do not die from some terminal infection are more likely to succumb to uremia than from any other cause. The uremic condition is simply secondary to an obstruction of the ureter with resulting hydronephrosis. Fatal hemorrhage is apparently a very rare occurrence in carcinoma of the uterus.

With our present knowledge of the treatment of uterine carcinoma the only hope lies in a positive early diagnosis. In some diseases in which the true diagnosis may be suspected early it is often proper to adopt expectant treatment and allow further observation to establish fully the diagnosis. When dealing with uterine carcinoma, however, expectant treatment is nothing less than criminal. The patient loses her only chance while we wait for the other clinical symptoms to establish the diagnosis.

Occasionally we will find that a uterine carcinoma is well advanced and the case hopeless when the first symptom appears. But fortunately, nearly all cases give warning at an early stage, and if the warning be heeded, many more patients can be saved. One is often appalled by the large number of inoperable cases of uterine carcinoma, and the question naturally arises as to why the diagnosis is not made earlier. In answering this question we must consider it both from the standpoint of the physician and the patient.

There is a general feeling of skepticism among the profession as to the end results of surgical treatment for cancer of the uterus. Many a doctor has expressed his sincere doubts as to the advisability of attempting to cure cancer of the uterus by surgical means, hence he does not realize the importance of the early diagnosis. We must first of all convince such a practitioner that cancer of the uterus has been and is being cured by operation. He will perhaps relate various cases where the patient had a recurrence after a vaginal or abdominal hysterectomy. However, he must be shown that with the development of the radical abdominal operation as first practiced by Wertheim, a new era has been introduced, and that with the proper kind of cases, cancer of the uterus can be cured. The practitioner's skepticism, sincere though it be, robs many a patient of her only chance of cure.

Delay in making the diagnosis when cancer of the uterus is suspected may mean an inoperable case when at last it reaches the surgeon's hands. There is but one remedy for this,—the physician must be impressed by the importance of early diagnosis, and must know how to make it. He must look with suspicion on any increase

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in bleeding in a woman approaching the menopause. It is true that many women bleed more freely for a short time just before the cessation of the periods. In most cases an increase in flow at the change of life, no matter how slight, means disease, and in many instances the serious disease under discussion. When the patient comes to us because of bloody discharge, whether it be menorrhagia or metrorrhagia, profuse or slight, we should look upon the condition as suspicious and judge it to be malignant until it be proved otherwise; nor should time be lost in determining the nature of the lesion. As we cannot differentiate in a clinical way, our only recourse is to a microscopic examination. If the cervix looks suspicious we should remove a piece for diagnosis. If the cervix appears normal the uterus should be curetted, and the specimens removed should be sent at once to a competent pathologist. After we have done this and done it quickly, then and only then can we feel assured that we have done our duty by our patient. No doubt many excisions will be made without discovering carcinoma, but every time we find an early case we will feel repaid for our efforts.

In most cases the failure to make an early diagnosis cannot be laid at the door of the physician. The physician is helpless if the patient does not present herself for treatment. Although there is a general feeling among the laity that the change of life is a trying time for the woman, the ideas as to what should normally happen at this time are very indefinite. Almost invariably when asked why she did not consult her physician earlier, the patient replies that she thought the hemorrhage to be due to the change of life and therefore to be endured. The patients realize that they should eventually cease flowing, but consider it a normal occurrence to have this preceded by a period of excessive or irregular loss of blood. It is true that this does occur in some women who do not develop cancer, but there is no way of being sure unless every patient with irregular bleeding be curetted for microscopic diagnosis. It is absolutely essential that patients should be taught that the change of life means lessened flow, and that any increase in flow at this period may mean disease, and that it demands immediate and thorough investigation.

If the physician is on the alert and patients are trained to report the first symptoms, will we then save every patient with uterine carcinoma? Unfortunately no, but we will save many more than we do now. Several patients in the series were cognizant of the possibilities and reported to their physicians, who at once recognized the condition as far advanced carcinoma. One patient in particular was in the hands of the gynecologist within two weeks after the first symptom, only to find that the disease was inoperable. Fortunately such cases are exceptions.

The whole question of early diagnosis of uterine cancer then is one of education. We cannot emphasize this too strongly. This education must reach both the profession and the laity. It will require

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time and repeated effort, but it must be done. We can do for cancer what has been done for tuberculosis. Information should be distributed by pamphlet or reprint, rather than through the medium of the newspaper. It can be done in a quiet way with no resulting hysteria. The day surely will come when seventy-five instead of twenty-five per cent of cases will be operable. Instead of curing fifty per cent of those operated, eighty or ninety per cent will be saved.

CONCLUSIONS.

(1) Cancer holds fifth place as a cause of death in Michigan.

(2) During the last five years the death rate due to cancer in Michigan has increased fifteen per cent.

(3) Among gynecologic patients one in every twenty-five has cancer of the uterus.

(4) In five-sixths of all cases of cancer of the uterus the disease is primary in the cervix, and in one-sixth of the cases it is primary in the fundus.

(5) The age limit of carcinoma of the uterus is wide, from twenty-eight to seventy-five years. The average age is forty-eight years.

(6) Carcinoma of the cervix occurs most frequently between thirty-five and fifty-five years of age; carcinoma of the fundus between forty-five and sixty-five years of age.

(7) Carcinoma of the fundus develops over a longer range of years than carcinoma of the cervix.

(8) Patients with cancer of the cervix present a history of childbearing in ninety-two per cent of all cases. Among patients with cancer of the fundus the percentage is seventy-two.

(9) Cancer of the uterus, although more common in parous women, may develop in nulliparæ.

(10) Heredity has very little part in the development of uterine carcinoma.

(11) Carcinoma of the uterus can be cured by operation. In order to obtain a cure, however, the diagnosis must be made early.

(12) The early diagnosis of carcinoma of the uterus depends on giving close attention to the earliest symptoms. An increase in bleeding in a woman approaching the menopause demands a careful investigation and a microscopic examination of tissue from the cervix and fundus.

(13) The first symptom of carcinoma of the uterus in seventy-three per cent of cases is an increased menstrual or an irregular intermenstrual discharge of blood.

(14) Watery and foul discharge and pain are symptoms occurring at a later stage of the disease.

(15) Carcinoma of the uterus occurs in many healthy and robust-looking women. Cachexia occurs only in advanced stages of the disease.

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(16) The radical abdominal operation offers the only absolute cure for carcinoma of the cervix. Carcinoma of the fundus can be cured by a less radical operation.

(17) In inoperable cases temporary relief can usually be secured by a palliative operation.

(18) Most of the patients afflicted with this disease die either from some terminal infection or from uremia.

(19) To obtain earlier diagnoses the profession, as well as the laity, must be educated.

(20) All women must be taught that the menopause means lessened flowing, and that any increase in flowing at this time may signify disease.

(21) An organized campaign of education is necessary if more patients are to be saved from cancer in all its forms.

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TWO UNUSUAL HEPATIC CASES.

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I SHOULD like to place on record the details of two rather unusual cases of hepatic disease that have come to the University Hospital within the last two months.

Case I.—Mr. W., Mount Pleasant, Michigan, salesman, aged thirty-five, comes to the hospital for persistent jaundice. His family and personal history are negative. His habits are good and he denies venereal disease. On the 2d of April, 1912, he awoke in the morning feeling somewhat indisposed but with no definite symptoms. About three days later his urine became dark and a physician told him that it contained bile and he would probably become jaundiced. This prophecy was shortly verified. Since then the jaundice has become more and more marked, with some improvement about two weeks ago, although he never lost the bile in his urine.

His appetite was poor throughout, and he has lost thirty-five pounds since the date mentioned. Until two weeks ago he passed clay-colored stools; then they became yellow for a short time and now are again the typical clay color. He has had some trouble with sour eructations and vomiting, about a half hour after meals. There is absolutely no pain and never has been any. There is no history of fever or chills. He has the other usual symptoms of a severe jaundice.

Laboratory findings: Blood count shows 3,180,000 reds, 6,500 whites, and sixty-five per cent hemoglobin. His urine is negative except for a large amount of bile and a few granular casts (commonly seen in bilious urine). His stools are characteristically clay-colored, contain much fat and show slight test for occult blood (also common in jaundice). The stomach contents show a slight hyperchlorhydria

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and a rather large amount is recovered after the usual interval when shredded wheat biscuit is taken.

On physical examination the abdomen was found to contain a large firm mass on the right side, extending two finger breadths below the umbilicus and about in the gall-bladder region. This mass is smooth, firm and descends on inspiration and can be palpated from behind. It is neither tender, nor elastic and gives the impression of being a firmly distended gall-bladder. In addition the right kidney can be felt below the mass to a point about four finger breadths below the umbilicus; it seems to move independently of the mass before described.

The patient was transferred to the Surgical clinic for exploratory operation. The diagnosis at this time was thought to be carcinoma of the bile passages with a distended gall-bladder. An exploratory incision was made by Doctor Darling, who found a large but apparently normal looking liver, extending about as far as the physical signs had indicated but the gall-bladder was empty and bile passage free. He could find no evidence of malignancy or any other localized disease. The patient was returned to the Medical ward and treated as a case of catarrhal jaundice. He made a fairly satisfactory recovery to the extent of gaining weight, regaining his appetite, recovery from gastric symptoms and improvement in his blood findings. He left the hospital against advice with the promise to keep us posted as to his future progress.

Even with this history it seemed as if the diagnosis of carcinoma was justified because of the marked loss of weight; the emaciation; the anemia and the physical findings. To be sure these were misinterpreted, but the error is such as anyone is apt to make.

Case II.—The second case is that of Mr. D., engineer, aged thirty-one. He comes to the hospital because of progressive enlargement of the abdomen. He was not feeling well for several weeks but worked until three days before he entered the hospital. His previous history was characterized by rather an unusual number of acute infections with good recoveries. In addition he had several Neisser infections and confessed to having had a soft chancre on two occasions. His tongue became fissured and he had many sores within his mouth. He, himself, was firmly convinced that the "stuff was in his blood." On Christmas day, 1911, he took a severe cold and following this had a few pains in the abdomen, indigestion, sour stomach and a feeling of a lump in the stomach region. This disappeared until three weeks ago. Following this he had some pain on either side of the back bone, which did not radiate. His back became very sore, bloating became progressively worse, and he had a little fever. There have been no chills but he has lost ten pounds and is a little short of breath. He entered the University Hospital on the 10th of May.

Physical examination: The patient is thin, rather emaciated, with pale mucous membranes. The thorax is negative except for upward

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displacement of the thoracic viscera. The abdomen is above rib level, with distension most marked in the epigastrium. A shadow descends in this region and there can be felt a tender mass. Another small nodule is palpable just a little above and to the left of the median line. The liver edge is plainly felt in the right mammary line on a level with the umbilicus and can be traced across the abdomen, with the gall-bladder notch at the border of the right rectus. The median notch is also easily made. The liver edge is hard and somewhat rounded and quite tender. The spleen is not increased in size. There is considerable fluid in the abdomen and there is slight edema of both ankles. There is general glandular enlargement.

Laboratory fiindings: The blood showed marked anemia; forty-six per cent hemoglobin; 4,000 whites; differential count not notable. The urine is negative. There is no bile in the urine. His stomach shows a hypochlorhydria; on several occasions free hydrochloric acid was absent but the Sjöqvist test for loosely combined hydrochloric acid was positive in each case. The microscopic findings are negative. The stools showed nothing pathologic. The Wassermann reaction was negative.

The patient was referred to the Surgical clinic for an exploratory operation, which was done under local anesthesia by Doctor Darling. An incision was made over the right rectus and a large amount of fluid (straw-colored) escaped and coagulated very promptly. An enlarged firm liver presented, showing normal color, rather softer towards the edge but quite firm along the right side of the gall-bladder. The left lobe was not examined. As far as the exploration could be made, there were no nodules, nothing unusual about the liver, no adhesions nor tumors. The opinion of the surgeons was that it was a syphilitic condition, and in spite of the negative Wassermann, syphilitic treatment was begun. The patient began to fail rapidly. The ascites accumulated from time to time, so that a number of tappings were necessary to render him comfortable and he finally died from exhaustion fifty-three days after entrance.

The liver, both kidneys, stomach and a portion of the duodenum and pancreas became available as pathologic specimens, which I am showing you here. The liver shows several large firm masses in its left lobe and along its under surface. The location of these masses explains why they were not found by the surgeons. With a small incision made under a local anesthetic, only a small area of the right lobe presented itself underneath the incision. The major portion of this mass, however, is in the left lobe, where also is the greatest enlargement. It has all the characteristics of a carcinoma and will undoubtedly prove such on microscopic examination.

Our diagnosis of syphilis was based on what subsequently proved to be insufficient evidence, namely, an uncertain history and the presence of the greater part of the process in the left lobe of the liver and in a young man. The negative Wassermann was not seriously con-

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sidered because cases of late syphilis, without Wassermann reaction, are not so very uncommon, so that a negative Wassermann does not exclude a suspicion of syphilis.

(Since the presentation of these cases, Doctor Warthin's report on the material has come to hand, showing a carcinoma involving the liver, pancreas, stomach and duodenum, and probably primary in the pancreas.)

415 Ingalls North.

A CASE OF PARASITIC FIBROID TUMOR OF THE UTERUS.

HOWARD H. CUMMINGS, M. D.

INSTRUCTOR IN OBSTETRICS AND GYNECOLOGY IN THE UNIVERSITY OF MICHIGAN.

ANN ARBOR, MICHIGAN.

A school-teacher, aged twenty-six, single, entered the Gynecologic clinic because she could feel a tumor mass in the lower part of the abdomen. She had no symptoms, and with one exception her history had been uneventful and perfectly normal. The one exception consisted of an attack of pain in the right side which occurred in January, 1912. At that time she was nauseated, vomited, and had a fever. The attack lasted ten days, after which she felt perfectly well. Her condition was diagnosed as appendicitis but her physician noted a firm tumor in the lower abdomen and pelvis. This was the first time the patient had known of the presence of the tumor and it worried her a great deal, although it was symptomless.

An examination showed the patient's general physical condition to be excellent. The abdominal and vaginal examinations were as follows:

Abdomen soft, moderately thick panniculus and muscular wall. In the lower part of the abdomen there is a firm, smooth mass extending almost to the umbilicus and two inches on either side of the median line. This mass is slightly movable and becomes narrow as it approaches the pelvis.

A vaginal examination reveals an intact hymen, external and internal perineum normal, the cervix deep in the pelvis. The pelvis is filled with a firm mass fully as large as a cocoanut. The cervix is felt behind the mass and apparently connected with it. Diagnosis—Symptomless fibroid of the uterus.

Two weeks after the patient was examined, she returned for an operation, which was performed by Doctor Peterson. The abdomen was opened by a median suprapubic incision. The peritoneum was incised and it was found that the omentum was adherent to it. The omentum was freed from the peritoneum and when packed back, a large kidney-shaped fibroid tumor came into view. The tumor filled the anterior culdesac and had crowded the uterus, tubes and ovaries back against the posterior wall of the pelvis. At the superior pole of the tumor, three loops of small intestine were adherent to the mass,

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also the parietal peritoneum was attached to it on either side. When these adhesions were freed, it was discovered that the tumor was not connected with the uterus in any way and that the generative organs were normal in every respect. The appendix and gall-bladder were normal. The abdomen was closed in the usual manner and the patient made an uneventful convalescence.

The macroscopic examination of the tumor shows a fibroid tumor which is kidney-shaped and measures sixteen centimeters in length by ten centimeters in width. On one side of the tumor there is an area resembling a hilus and shows dense adhesions and scar tissue. There are numerous finer adhesions over its surface. On section the tumor is reddish brown in color and shows typical red degeneration.

Parasitic, wandering or migratory fibroids are pathologic curiosities and because of their relative infrequency, their origin and manner of living, they are always interesting.

In 1899 Kelly and Cullen reported twenty-eight cases of parasitic fibroids showing various stages and complications.

In 1905 Doctor Peterson read a paper on migratory uterine fibroid before the American Gynecological Society. He reported three cases and abstracted twenty cases collected from the literature. One of these cases, reported by W. Gill Wylie in 1894, was a tumor very similar to the one found in the case reported tonight. It is described as a hard tumor, the size and shape of a large kidney, and holding the uterus back in the pelvis.

The second case reported by Doctor Peterson showed a subperitoneal uterine fibroid, the size and shape of a normal kidney with a narrow pedicle twisted one and one-half times upon itself, attached to the omentum and appendix.

He says in discussing the case:

"The resemblance of the fibroid growth to a kidney was striking. Even when exposed through an abdominal incision it became necessary to trace the tumor's connection with the uterus before its exact nature could be determined. In Wylie's case, the tumor also was the shape and size of a large kidney. Certainly these two cases should be remembered in endeavoring to ascertain the exact nature of a pelvic tumor resembling the kidney in shape and size, especially when one considers the frequency of floating right kidney, and the possibility of the kidneys being adherent in the pelvis."

The origin of migratory fibroids has been well explained. There is a tendency for fibroid growths of the uterus to work their way to the surface, so that interstitial fibroids often become subperitoneal in location. Kelly thinks that the rhythmic contractions of the uterus play a part in this movement. Likewise there is a tendency for subserous fibroids to become pedunculated. As the tumor grows it develops unequally, and gravity, exertion and relaxed abdominal walls allow the tumor to rotate. This interferes with the blood supply of the fibroid and it undergoes degenerative changes. The surrounding peri-

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toneum, omentum or neighboring organs attempt to wall off the degenerating foreign body and thus adhesions are formed. Through these adhesions the neoplasm gains a new blood supply.

The tendency for pedunculated fibroids to twist, possibly explains the kidney-shape of some of these tumors. The pedicle was or had been attached to that part of the tumor which later appeared as a hilus; as the blood supply was gradually shut off by twisting, the pedicle and adjacent parts of the tumor would undergo atrophy and shrinking. The remaining part of the growth would be nourished by adhesions.

In the case reported the attack simulating appendicitis was a possible twist of a pedicle or an inflammatory process in the omentum. The appendix was found to be normal.

DISCUSSION.

DOCTOR LESLIE H. S. DEWITT: The tumor reported by Doctor Cummings was not adherent to the omentum as practically all migratory abdominal tumors are. Most of the blood supply for these tumors is derived from the omentum. The vessels become very large, some as large as one's finger. A very unusual case of migratory fibroid was reported by Kelly of the Johns Hopkins Hospital. The tumor weighed eighty-nine pounds and was of eleven years' standing. It was densely covered with omental adhesions and large tortuous vessels. The tumor was successfully removed and the patient recovered.

DOCTOR GEORGE KAMPERMAN: As brought out in the discussion, these tumors are rare. We have had three or four of them here within the last five years. There are other tumors that also become migratory. Most of the parasitic tumors are solid, as cystic tumors degenerate too soon and form abscesses. Ovarian fibroids may become parasitic. About two years ago a case in which part of an ovarian cyst had become detached was reported in this society. In this case the cystic parasitic tumor was attached to the omentum.

Cullen has described the origin of these tumors very well and has shown how the omentum winds itself around the tumor after a twist occurs and as time goes on loses all of its fat. Then there is nothing left but a bunch of large blood-vessels passing from the transverse colon down to the tumor, giving the appearance of large angleworms. One case of fatal hemorrhage is reported, due to the sudden twisting of the tumor causing the rupture of these vessels. We have never seen that stage in this clinic.

REPORTS OF CASES.

A STUDY IN RENAL EFFICIENCY BY THE PHENOLSULPHONAPHTHALEIN TEST.

LUTHER F. WARREN, M. D.
Department of Medicine.

The phenolsulphonaphthalein test to determine the efficiency of the kidney is an important aid in certain cases in diagnosis, prognosis and treatment. The following report is taken from a series of cases in the

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Medical clinic during the past year, and includes albuminurias, chronic parenchymatous and interstitial nephritides, high pressure cases and a few cases of cardiac renal disease. The value of the test to the surgeon has been purposely omitted in this series.

We had an opportunity to study seven cases of albuminurias which were clinically not of a severe type and found that the excretion of each was above the low normal limit, the excretions varying from sixty to seventy-four per cent. Other cases where the finding of albumin was coupled with other clinical symptoms gave excretions so low that a mere trace of the drug was only excreted in two hours. This is in accord with the results of other workers, that the excretion of the dye is related in no way to the presence of albumin. The following cases illustrate this:

A boy, twenty-two years old, gave a finding of a third volume albumin between the hours of 7 and 10 in the morning. Toward noon only a trace of albumin would be present, and later in the day it would entirely disappear. This continued during his stay at the hospital and the history showed that he had been troubled with this condition for two years. He presented no cardiovascular signs, no eye findings, and no other urinary findings. His excretion at the time albumin was present was sixty-three per cent while in the afternoon it was sixty-one per cent which is within the error of personal reading. The following morning the patient was kept in bed, albumin was not present and he again excreted sixty per cent. The value of the test in this case helped us to better classify his condition as an orthostatic albuminuria with kidneys functioning quite normal.

There were five cases of chronic paranchymatous nephritis with an excretion varying from thirty-eight to sixty-nine per cent. From these few cases, it is not possible to judge the cause of this variability of excretion. However, in our series of chronic interstitial nephritides, forty in number, this phase will be taken up and conclusions drawn which may be more trustworthy. Several factors have to be taken into consideration in this disease, as those of pressure, the excretion of albumin, the specific gravity, and the amount of urine excreted daily and the relation to cardiac involvement. In this disease, as in those previously mentioned, the presence of albumin, bears no relation to the amount excreted. In my series, blood pressure is not comparable with the amount of dye recovered at the end of two hours. We have cases with blood pressure running 240 millimeters of mercury, which show from a mere trace of phenolsulphonaphthalein to sixty-five per cent in the allotted time. We also have cases with moderate pressures showing the same phenomena. From these figures, it can readily be seen that pressure has no relation to the amount of the dye excreted. In comparing the specific gravities of twenty-four hour samples of urines with the excretion in each case, we have found that the amount recovered stands in direct relation to the specific gravity. A low specific gravity has been associated in each case with a low

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excretion and a specific gravity of normal or above has been supported in each case by normal or slightly below normal excretion, irrespective of the amount of albumin present or of the blood pressure. Of the cardiorenal cases studied the excretion varied from sixty-five to twenty-nine per cent, and this again enabled us to determine whether the kidneys were most at fault or whether it was a primary cardiac case with albumin and casts in the urine, due to chronic congestion.

The relation of this test to the prognosis of the case is of the most importance. Since November last, we have obtained a secretion of less than thirty-five per cent in fifteen medical patients, and of these seven have died. One has had cerebral hemorrhage and one is in the hospital at the present time. The remaining patients are at large through the state, and I have been unable at the present time to determine their exact condition. The average length of time that patients with this low excretion have lived, in this series, is three months. The treatment in a given number of cases is made much more satisfactory by understanding the function of the kidney, as we may try some other avenue for improvement other than overworking the already damaged secreting epithelium of that organ.

DISCUSSION.

Doctor James G. Van Zwaluwenburg: Theoretically this subject is very complex. In spite of the immense amount of work which has been done on the physiology of urinary excretion, we are still in the dark as to the exact relationship of the different urinary constituents to the various kidney tissues. The work in artificial nephritis has not thrown a great deal of light upon the subject, although there is reason to believe there are three very distinct lesions in the kidney, showing a very different symptom complex. In man the situation is further complicated by the fact that these lesions rarely occur singly but in combinations of various degrees and more or less localized. The clinical classification into parenchymatous and interstitial nephritis may be very sharp during the early stages of the disease. Secondary changes soon or late lead to merging of the types and obscure the diagnosis.

The study of the excretion of the normal and pathologic bodies in the urine has never led to any conclusions of service in estimating the severity of the case. We are still ignorant of the nature of the poison or poisons concerned in the fatal termination. The use of a synthetic which shall approximate the properties of this poison would be highly desirable, if feasible, but the question still remains whether one body can represent all the various constituents which may lead to trouble.

Phenosulphonaphthalein must therefore depend purely upon empirical, clinical investigations. So far, the results seem to be of distinct value, in that a low excretion appears to indicate a serious reduction

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in the excretory power of the kidney. Doctor Warren's findings agree very well with those of Rowntree and Geraghty in indicating fairly prompt termination in all cases showing less than thirty per cent excretion within two hours after subcutaneous injection. There are, however, quite a number of cases showing definite signs of nephritis according to the old clinical criteria, with an almost normal excretion. We scarcely seem justified in assuming there is no disturbance of kidney function in such cases. Probably we shall find that nature has provided a considerable margin of safety against possible damage and only when this limit is exceeded do we get reduction in the quantitative elimination of the dye. It must be remembered, however, that in these cases phenolsulphonaphthalein is not a fair representative of bodies whose excretion is retarded and which are capable of damage.

Its principal value seems to lie in differential diagnosis between certain chronic obscure conditions and in surgical conditions. Particularly valuable is the demonstration of kidney insufficiency complicating a cystitis where the urinary findings are not distinctive and in the localization of disease in unilateral surgical lesions by means of the ureteral catheter. As an example of its use, in the former class of cases, I may mention that of a man of about fifty-five, coming in for weakness, and showing a marked anemia without apparent cause. His urine was negative and there was no evidence of hemorrhage or of malignancy anywhere. Most cases of marked anemia in the elderly without obvious cause, prove to be nephritic. In this case, however, the excretion was practically normal and the patient was sent home for a month, at the end of which time his blood showed a picture sufficiently characteristic to justify a diagnosis of pernicious anemia.

Doctor Howard H. Cummings: I had an opportunity to see Goldsborough and Ainley carrying on this functional test of the kidney in Johns Hopkins Maternity service. The interesting point to me was that pregnant women would excrete from fifty to sixty per cent of the dye before confinement and a few days later, after confinement, would excrete seventy per cent or more. This finding corresponds very well with the old idea, that excretion of the kidney is decreased during pregnancy and that this probably gives rise to some of the toxemias of pregnancy.

Doctor Henry A. Stephenson: I know very little about the test made in the Obstetric clinic at Hopkins. As far as I know it has not been very satisfactory as there is considerable variation in the output from the same patient on different days. In regard to the point brought out by Doctor Cummings, it was definitely decided that it does decrease in pregnancy. However, there is no definite rule and no very definite conclusions could be drawn from the cases tested. I do not know of any cases followed longer than a few days in the puerperium.

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REPORT OF A CASE OF CHONDROMA OF THE ELBOW-JOINT.

CYRENUS G. DARLING, M. D.
Department of Surgery.

Miss M., Hart, Michigan, age twenty-one years, single, a school-teacher, entered the University Hospital June 19, 1912.

Family History.—Father died of Bright's disease. Mother living and well. One brother and sister living and in good health.

Personal History.—The patient was always sickly as a child because of throat trouble. She had measles as a child, but gives no history of any other contagious disease. She began to menstruate at fourteen years of age and has been regular since that time.

Present Trouble.—About seven years ago she met with an accident by falling from a horse. She fell on the left hand with the arm extended. It was noticed later that there was a sensation of soreness in the left elbow and that the right ankle was sprained. A physician was not called for nearly a week. He examined the elbow, found nothing displaced, but said the bad feeling at that point was due to a sprain. The soreness continued without any particular change and two months later she had it examined by the same physician, who found no deformity and expressed the same opinion which he did at the first visit. It was noticed from this time on that she always favored this arm, avoiding all unusual motions and never lifting a heavy weight with it. During the next two years there was no examination by a physician. The elbow was never free from pain, nor entirely strong. At this time it was first noticed that there was a growth on the outer side of the arm just below the elbow-joint. A physician made an examination and had a skiagraph made. His diagnosis was not given. He treated the arm for about two months, first using friction, then putting it at a right angle in a tin splint in which position it was allowed to remain for two weeks. At the end of this time it was comparatively stiff and it took about six weeks of passive motion and massage to restore it to its former position. Before this treatment it was noticed that the joint could not be entirely flexed or extended and since that time there has been a slight increase of this deformity. Home remedies were applied, but no physician was consulted until one year ago, when she went to Grand Rapids, had the arm examined and another skiagraph taken. A diagnosis of tumor was made at this time and an operation advised. She was told that it was not necessary to have this done immediately. Later she consulted another physician, who thought the deformity must be due to a fracture, but he gave no treatment. She entered the University Hospital on June 19, 1912.

The patient is well formed and except for the elbow is in perfect health. The upper part of the left forearm is somewhat larger than the right. The most prominent point can be seen and felt around the head of the radius and between the radius and ulna. The mass can also be felt across the anterior portion of the forearm, at the bend of

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the elbow, extending entirely across to the internal condyle of the humerus and a little above it. It gives the impression of being deeply fixed and is very hard. On the outer side where it is most prominent, it feels as hard as bone or cartilage. The head of the radius can be freely rotated in this mass showing conclusively that it is not attached to this bone. It is difficult to tell by motion whether this is attached to the upper end of the ulna or the lower end of the humerus. It seems to move upward and downward when the forearm is extended or flexed. The forearm can be flexed to a little more than a right angle and extension is slightly limited. The patient complains of tenderness when the tumor is handled, especially on the other side. There is no tension of muscles to indicate that they are involved in the limitation of motion, nor is there any appearance of wasting of the muscles of the forearm or hand. A skiagraph shows no marked deformity of the bone and while the dim outline of the tumor is shown no evidence as to its origin is given.

An incision was made over the most prominent portion of the tumor and a piece removed for diagnosis. The pathologist reported "chondroma" and advised that the tumor be removed. The operation was performed on June 25. An incision about four inches in length was made from the external condyle of the humerus directly down the forearm. This was carried down to the fascia and the muscle split over the most prominent part of the humerus. This allowed an easy approach between the radius and ulna. The tumor was then enucleated in fragments by means of the curet and forceps. The operation had not proceeded far when it was discovered that the tumor was in the joint and extended clear across the anterior part of it. It seemed to arise from the epiphyseal portion of the lower end of the humerus, the remainder being entirely free in the joint. The tumor was somewhat lobulated and irregular. A second incision was made on the inner side of the forearm so that all fragments could be removed from that part of the joint. The tense structure of the capsule could be easily felt and it could be definitely determined that the tumor had no connection with the smooth surface. The wound was closed without drainage and the arm placed on a splint and an ice cap applied.

REPORT OF A CASE OF OLD UNUNITED INTRACAPSULAR FRACTURE OF THE HIP-JOINT.

JOHN H. PETTIS, A. B., M. D.
INSTRUCTOR IN SURGERY IN THE UNIVERSITY OF MICHIGAN.

Mr. H. M., single, mechanic, American, aged thirty, entered the surgical clinic of the University Hospital April 15, 1912, because of inability to use his right hip.

He was always well and robust until two years ago when he contracted syphilis for which he received treatment for five weeks and was pronounced cured.

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In June, 1911, he jumped from a moving train and sustained injuries which rendered him unconscious for a number of hours. When found by a passerby some eight or ten hours after the accident he was still dazed and in a semiconscious condition. On being aroused he tried to turn over but was unable to do so on account of great pain in his right hip and thigh. Physicians were sent for who examined him and ordered him removed to a hotel in a nearby city. Here he was put to bed and extension applied. He remained here for about three weeks at the end of which time he was placed on a stretcher and taken to his home city some hundred miles distant. He was then examined by his family physician who expressed the opinion that the hip was dislocated and advised an examination under anesthesia. Following this examination the patient was assured that the dislocation had been reduced. Extension was again applied and the patient remained in bed three weeks. He then got about on crutches but was unable to bear any weight on the right foot. He could flex and extend the leg and could abduct and slightly extend the thigh but could not flex it. His condition remained about the same until he entered the hospital about one year after the accident.

When examined at the hospital his ability to move the limb was about as above described. Measurements showed the right limb to be about one and one-half inches shorter than the left and the right trochanter above Nelaton's line. The right toe was somewhat everted. Pressure over the trochanter was no tpainful, and there was no resistance offered to passive movements. When the limb was manipulated a muffled crepitus could be felt not unlike the rubbing together of two cartilaginous surfaces. A diagnosis of ununited fracture of the head of the femur was confirmed later by the radiograph. A Wassermann test was negative, as were also all other laboratory findings.

As nearly a year had elapsed since the injury and less radical measures had failed to give satisfactory results it was decided that operative treatment offered this man the best chance of obtaining a useful leg. He was operated upon May 6, 1912. A longitudinal incision was made over the trochanter and the capsule opened in front. A considerable amount of interposed tissue was removed from between the fragments, no doubt remains of the torn capsule of the joint. The tissue was removed and by traction and manipulation the fragments were brought into as good a position as possible. A screw was then driven through the trochanter into the fractured head. The patient was put to bed and the limb immobilized by extension, sand pads, and a long external splint. A radiograph taken at the end of three weeks showed that one of two things had occurred—either the screw had been too short to firmly grasp the head of the bone or, because of insufficient immobilization of the limb, the fragments had been torn apart. Another operation was therefore advised. The old incision was opened, the screw removed, and the parts again brought into position as before. Instead of the screw, however, two twelve-penny

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finishing nails were driven through the trochanter into the head in the manner shown in the radiograph exhibited. A plaster dressing including the pelvis and the entire extremity to the ankle was then applied. A radiograph taken several days after this operation showed the bones in good position.

It has now been about five weeks since the last operation and although it is likely that the union is fairly firm we shall keep this man in bed with this dressing on for some time yet. We will first remove the plaster dressing and begin passive movements while the patient is still in bed. Gradually active movements will be encouraged until finally he is able to get about with the aid of crutches. At the end of three months if our efforts have been successful he should be able to use the leg without very much difficulty.

This case is reported not only because it is a comparatively new method of treating these cases in this clinic but also to illustrate some of the mechanical difficulties encountered. The interposition of tissue in this case possibly explains why so many of these fractures fail to unite. Whether or not the luetic infection had anything to do with failure of union in this case I cannot say for the fact that this man gives a negative Wassermann reaction does not, of course, exclude this possibility.

DISCUSSION.

Doctor Cyrenus G. Darling: Remember that this is an old fracture, one which has been about a year without treatment, so it was impossible to restore it or get it back in place as one might with a recent fracture. The question may be asked just how far one can carry this treatment in fractures of the neck of the femur. Such fractures usually occur in people of advanced age and the question of adding to the shock of injury by such an operation should be seriously considered before attempting it. Many of these people die of the shock and confinement which is necessary when such a fracture occurs. The method of plating a fracture or nailing the parts together is a very desirable method of treating fractures because one can immediately put on a fixed dressing the same as we had in this case and allow for quite a good deal of motion. The method of applying the plaster dressing may correspond to the age of the patient, or to what he may be able to stand. That is, in the case of a patient who would in all probability not stand confinement in the prone position with a plaster dressing, we may apply the latter with the leg elevated. Later the leg may be allowed to drop down, to permit of reclining in bed instead of being laid out on the bed. It will not do to use this method in very old people any more than some of the other methods, because it is dangerous to put them down in bed and keep them there. They die of the shock and confinement.

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TRANSACTIONS
OF THE
CLINICAL SOCIETY
OF THE
UNIVERSITY OF MICHIGAN

STATED MEETING, AUGUST 7, 1912.

THE PRESIDENT, ALBION WALTER HEWLETT, M. D., IN THE CHAIR.
REPORTED BY REUBEN PETERSON, M. D., SECRETARY.

READING OF PAPERS.

THE PATHOLOGY OF STREPTOCOCCUS INFECTION OF THE UPPER RESPIRATORY TRACT.

ALDRED SCOTT WARTHIN, PH. D., M. D.
PROFESSOR OF PATHOLOGY AND DIRECTOR OF THE PATHOLOGIC LABORATORIES
IN THE UNIVERSITY OF MICHIGAN.
ANN ARBOR, MICHIGAN.

THE articles in Osler's "Modern Medicine" on "Acute Tonsillitis" and "Pharyngitis" may be taken as typical examples of the modern textbook treatment of these conditions. They are regarded as mild affections; their pathology is accorded scant attention, and they are considered almost wholly from the standpoint of local conditions rather than as septicemia with localizations in the throat, as in a large number of cases they really are. Very little emphasis is laid in textbooks of medicine upon the occurrence of such complications and sequelæ as arthritis, endocarditis, Ludwig's angina, acute nephritis, suppuration of cervical lymph nodes, pyemia, hepatic abscess, phlegmon, furuncle, phlebitis, femoral thrombosis, et cetera; yet no one can see a large number of cases of "sore throat" without realizing that such severe and sometimes fatal complications are not uncommon.

In the recent epidemic of "sore throat" in Ann Arbor the number of severe and fatal cases seems very high. As far as I have been able to ascertain between two and three hundred cases have been seen by physicians, and undoubtedly many mild cases were home-treated. The reported cases include every degree of acute tonsillitis and pharyngitis,

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bronchitis and bronchopneumonia. I have heard of nine fatal cases ascribed to this epidemic. In one case I have been able to make an autopsy. So far as the symptoms, complications and sequelæ are concerned I have been unable to learn of anything about this epidemic that has not characterized the tonsillitis epidemics we have had in Ann Arbor during the last twenty years. The most striking thing about it has been the large number of cases, and the apparently greater number of severe complications, particularly a diffuse cellulitis of the neck resembling Ludwig's angina, and a peritonitis. Yet I think the proportion of these severe complications not any greater than in past epidemics.

In 1892, during our first year in the new hospital, we came over one morning to find forty cases of acute tonsillitis, and during the next week about as many more cases developed. Cultures from many cases showed in all the same streptococcus, in all respects like the one we have seen in the present epidemic. Yet from my notes on these cases this relatively smaller epidemic of 1892 showed as high a percentage of severe complications and sequelæ in the form of erysipelas, phlegmon, pyemia, acute nephritis, arthritis, pleurisy and pneumonia with as high a mortality as the one of the last few months. I was deeply impressed at that time with the possibilities of streptococcus sore throat, even in apparently mild cases, and have always thought that the condition was not regarded seriously enough by physicians and laymen. In succeeding epidemics I have seen always about the same proportion of severe cases. In one year out of a class of medical students involved in an epidemic there were two cases of thrombophlebitis of the femoral. In another year we made an autopsy upon a student showing multiple abscesses in lungs and liver, with fibrinopurulent pleurisy following tonsillitis and pharyngitis; and I might recall other similar cases. I am sure that every practitioner in Ann Arbor who sees many cases of the epidemics of "colds" and "sore throats" that we have in Ann Arbor every year will bear me out in saying that severe or important complications occur in five to ten per cent of the cases.

As to the etiologic factor in epidemic pharyngitis and tonsillitis, some strain of the streptococcus is by far the most common and important. Inasmuch as Doctor Novy is to discuss the bacteriology of these infections, it is not my place here to take this up in detail, but I do not believe that from the characteristics of the epidemic or of the streptococcus isolated in some of the cases that the organism should be regarded as a new one or that the condition itself should be looked upon as a new disease. The most that we can say is that it is an especially virulent strain of streptococcus, but this is not sufficient reason for classing it as a new specific organism. The variability of the streptococcus is so great that we may think of specific strains for different individuals, as the Smith, Brown, or Jones strain, but this wide variation in degrees of virulence is not sufficient grounds for their

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classification as distinct varieties of organisms. This has been attempted so many times in the case of the streptococcus that it is now abandoned as not practical. The streptococci of rheumatic fever, of endocarditis, puerperal sepsis, phlegmon, pneumonia, erysipelas, tonsillitis, et cetera, are not now regarded by the best authorities as distinct and separate organisms, because we know that any streptococcus may produce one or all of these conditions in different individuals. It is the strain of the organism that counts somewhat, but much more, I believe, is it the infected individual who determines the virulence of the conditions resulting from the infection with a given strain. Our epidemics are of most frequent occurrence in the late winter or early spring, not infrequently after the midyear examinations, in students who have become more or less lowered in resistance from a combination of factors as worry, insufficient food and exposure to wet and cold. The severe cases occur in individuals more or less below par, as in the case of the two patients discussed here tonight, one of them, the medical student, being distinctly cachectic and anemic. The long, severe winter we have passed through with the unfavorable spring may in part account for the lowering of resistance of a large number of individuals, and thus partly explain the widespread character of the present epidemic.

As to the part played by milk or water in the causation of this epidemic I can see no reason that either can be an etiologic factor. The chief factor is direct infection, from one individual to another. When one case of streptococcus "cold" or "sore throat" occurs in a class of students the progress of the infection through the class is usually rapid and well marked. It does not appear in every individual affected in just the same localization or virulence, but the whole scale of streptococcus pathology may be run through. The same thing is true of family infections. What appears in one member of the family as tonsillitis becomes bronchitis, laryngitis, otitis media, mastoiditis, pneumonia or pleurisy, or only a mild "cold" in the others, and any of the infections may be followed by more serious complications such as acute nephritis, endocarditis, et cetera. Some families show a distinct tendency toward certain complications. In the recent epidemic I have heard of one family in which all the members developed arthritis.

From the standpoint of the pathologist I think it very wrong to regard the streptococcus infections of the upper respiratory tract as mild affections. And yet they are so regarded. Students with severe tonsillitis come to class and to examinations and spread the infection to many of their associates. Personally I think every acute case of this kind should be seggregated, and an educational campaign as to the nature of "colds" is needed. From the pathologic standpoint every streptococcus infection is a potential septicemia, and the streptococcus infections of the upper respiratory tract should be so regarded. They are septicemias with local manifestations, just as much as typhoid and

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croupous pneumonia are septicemias with localizations of the infection. All possible extensions and metastases of the streptococcus infection may occur according to the virulence of the infecting strain and the resistance of the host. Bronchitis, pneumonia, pleuritis, pericarditis, endocarditis, peritonitis, acute nephritis, phlebitis, thrombosis, septicemia, pyemic abscesses in lungs, liver, kidneys, spleen, et cetera, phlegmon, furuncle, erysipelas, arthritis, Ludwig's angina, middle ear disease, mastoiditis, et cetera, are all a part of the general pathology of streptococcus tonsillitis and pharyngitis and should be so regarded.

In conclusion, I think it inadvisable to regard this epidemic as a new disease or as one due to a specific organism.

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EPIDEMIC SORE THROAT IN ANN ARBOR AND OTHER CITIES.

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SEPTIC sore throat of various types and epidemic in character has been definitely described upon numerous occasions during the past twelve or fourteen years. Such epidemics were generally classed as tonsillitis until the English traced an epidemic to a certain milk supply in 1902 and gave the condition its present name. Such an outbreak was described by Gifford Nash[1] during June of that year, when forty-two cases occurred in twenty-two families using milk from the same source. Investigation showed that many cattle in this herd were suffering from suppurative mastitis and that the milk from these cattle was run through a separator with the idea that the cream was germ free. The iclnical features of these cases were described as being "characterized by a large amount of swelling of the tonsils, fauces, palate and uvula. The posterior pharyngeal wall was also involved in many cases. The affected spots were bright red and the tonsils presented many spots and patches of exudation. Distinct ulcers were frequently present on the tonsils and fauces, giving rise to difficulty in swallowing. The general symptoms consisted of severe headache, giddiness, backache and pains in the limbs—very much like a bad attack of influenza. The temperature was generally 102° or 103°, but in a few cases ran up to 104° or 105°. The tongue was dirty and there were gastric and intestinal disturbances. Great weakness was present and in many cases marked debility for weeks. In one instance quinsy formed. I did not see any other complications except enlarged glands at the angle of the jaw."

This clinical description tallies closely with the recent observations in this country except for the severity and variety of complications. Again in 1903 a similar epidemic was described by Swithinbank and Newman, who observed that during some years the clinical picture

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had been an atypical scarlet fever and during others similar to the type described above.

Doctor Josiah N. Hall[2], of Denver, describes a similar epidemic in this country thirty years ago but I am unable to find any report in the contemporary literature. The common complication was the formation of streptococcic abscesses in various parts of the body. There were no fatalities.

The first definite record of such an epidemic in this country is the classical report of Winslow[3] on the Boston outbreak during the summer of 1911. I shall briefly review this epidemic because it is so characteristic of all that have followed and because its etiology is so definitely settled.

The first cases were reported in Boston and its suburbs on May 11, 1911, and, during the next fifteen days, about fourteen hundred cases developed. The onset of the disease was characterized by three classes of throat pictures, that is, (1) Diffuse redness; (2) White follicular patches; and (3) Diphtheritic membrane. The latter two were frequently edematous. Inquiry established the fact that the disease was epidemic in Boston and its suburbs; no cases were occurring elsewhere in the state. Further, it was limited to certain districts in the city and was concentrated in the families affected. Of those affected, fifty-six per cent of the families had one case, twenty-two per cent had two cases, eleven per cent had three cases, and eleven per cent had four or more cases. It was about three and one-half times more prevalent among females than males and most prevalent among adults between the ages of sixteen to forty-five. The intensity of the disease increased with age, the infection being very mild in children and most fatalities occurring after the age of fifty-five. The mortality was about three and five-tenths per cent. In an effort to locate the causative agent all theories of the effect of dust, climate, and other local physical conditions as well as direct infection from person to person were ruled out by the concentration of cases. It was soon discovered that the distribution of cases coincided with the milk distribution of a single milk supply, the Deerfoot dairy. This dairy has two main supplies, one at both Southboro and Northboro. The supply distribution from Southboro corresponded to the distribution of the disease, not only in Boston but in the suburbs of Southboro and Marlboro. About ninety-three per cent of all infected cases are definitely known to have used this milk. Expert examination of the cattle at this dairy showed no instance of disease in cattle, but it was learned that several people in the locality and on the farms had had the disease several weeks previous to the outbreak of the epidemic. A very early case was the daughter of the dairy engineer and he, too, was affected shortly after. On May 1, the woman who received and mixed all milk, was ill with sore throat.

The Deerfoot dairy is one of the ideal dairy farms in this country and has boasted that no infection or contagion had been traceable to

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its product during twenty-eight years. Its cattle are regularly inspected by an expert veterinarian and a bacteriologic examination of the milk made eight times each month by an expert. All milk from any diseased udder or even from cattle, where there is sickness among the men handling the milk, is excluded. To promote honesty among farmers selling milk, the company offers to pay for the usual daily amount of milk without delivery in all cases where there is contagious disease on the farm, provided that the patron will immediately notify the company. This condition holds regardless of the severity of the case. An excellent handling system prevails at the dairy, the only human contact being where the receiving clerk smells the milk for acidity and pours it into a pipe leading to an enclosed mixing room.

The bacteriologic counts of this milk in May showed one count of three hundred thousand, one of two hundred thousand, and all others below. Two-thirds of farm samples were below fifty thousand and one-half below ten thousand.

The clinical aspects of the epidemic were admirably discussed by Doctor Eugene A. Darling[4] in a report upon the epidemic in Cambridge. The great majority of patients had the best environments. The incubation period appeared to range from thirty-six to seventy-two hours and in all cases streptococci were found.

The complications were most varied and frequently fatal. The list comprises abscesses in twelve per cent of the cases, as follows: Peritonsillar abscesses in twenty-four cases; suppuration of cervical nodes in twenty-four cases. Most cervical gland cases remained hard for several weeks and then receded without suppuration. Some of these were operated upon and no pus found. Suppurative otitis media, four cases, mastoiditis, one case.

The next complication, in order of frequency, was general septicemia evidenced by arthritis, endocarditis, pneumonia, and peritonitis. There were thirty-eight cases of arthritis; eight cases of peritonitis, four of which were operated upon and all of which were fatal. Free pus was found in the peritoneal cavity in all cases. All cases of death in patients under twenty were due to peritonitis; eight cases of pleurisy, three with effusion and three with empyemata. There were scattered cases of pneumonia, pericarditis, meningitis, laryngitis, acute nephritis, et cetera.

Headache, delirium, excitement, maniacal depression, temporary hemiplegia, and neuritis were the nervous complications. The greatest mortality followed pneumonia, peritonitis and septicemia in the order named.

Ten thousand people in Chicago and the village of Batavia suffered from a similar epidemic in December, 1911. The findings of Doctors Capp and Miller[5] in working out the source of this epidemic are quite parallel with the findings in Boston and are summarized as follows: "(1) It is conservatively estimated that over ten thousand persons in Chicago were victims of epidemic sore throat. (2) Of a total of six

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hundred twenty-two cases that were investigated, five hundred thirty-nine or eighty-seven per cent were users of milk from Dairy X. Of nineteen fatal cases investigated, fifteen or seventy-nine per cent were users of this milk. (3) A comparison of the prevalence of sore throat among consumers of Dairy X milk with that of consumers of milk from another dairy in the same neighborhood showed that the morbidity ratio was fourteen times as great among the former as among the latter. This ratio prevailed in three widely separated districts of the city. (4) An epidemic of mastitis involving four and six-tenths of cows supplying milk to Dairy X occurred during the winter months, and was worst about the Christmas holidays. (5) Sore throat of the epidemic type was prevalent among the farmers and milkers supplying Dairy X. Often bovine mastitis and human sore throat prevailed on the same farm at the same time. (6) A virulent streptococcus was isolated by Doctor Davis from the milk of a cow with chronic mastitis and from the throat of a girl on the same farm who had been ill with sore throat and arthritis. (7) The pasteurization records reveal a remarkable degree of failure to maintain a proper temperature. The days on which the most striking failures of pasteurization occurred shortly preceded the great outbreak of sore throat."

An epidemic of sore throat is reported by Doctor Hamburger[6] as occurring in Baltimore during February, 1911, which had the same characteristics as those reviewed. He describes an organism identical with the one isolated in Boston and Chicago, but Doctor Hirstberg,[7] writing upon the same epidemic a month later, endeavors to establish the pneumobacillus as the causative agent. The bacteriology of the condition will be reviewed later.

The epidemic in Ann Arbor began in March and totals approximately two hundred cases, presenting every possible variation and several fatalities. This illness has assumed various forms, ranging from a superficial septic throat to a condition charcterized by great congestion and swelling, with membrane formation, universal edema of the throat structures, suppuration, ulceration, and cellulitis followed by fatal purulent meningitis, peritonitis and general septicemia. The onset has been sudden, the prostration out of all proportion to the area of the apparent infection and cellulitis has been a frequent complication. Severe headache, slight soreness of the throat and some difficulty in swallowing, together with pallor and the appearance of grave illness have been the first warning to the patient. Following this has been a pyrexia varying from a slight rise above normal to 105°, a full bounding pulse rarely exceeding 100 in rate regardless of temperature elevation, slight increase in respiratory rate, normal luekocyte count, and not infrequently albumin and granular casts in the urine. In all cases smears and cultures from the throat have presented large numbers of streptococci occurring in short chains and very frequently in pairs. The cocci in the chains appear to occur in pairs. These organisms are Gram positive and present a definite cap-

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sule in smears. There is an abundant raised, moist growth upon blood serum. The early cases in this city were scattered and seemed to bear no direct relation to each other, but later cases point strongly to some article of food or drink as the carrier of the organism. Eighteen cases originated in one boarding house and among these were the most extensive and complicated involvement noted. Many other cases of milder types have been scattered throughout the town.

Fifty cases have come to the attention of this clinic, six of which were treated by other practitioners. The cases studied here admit of a clinical classification into several groups:

(1) Superficial septic throats. (2) Membranous septic inflammation. (3) Edematous inflammation. (4) Suppurative cellulitis.

"The first class, superficial sore throat, embraces a great majority of the cases. Its onset is sudden and severe. The patient has sudden intense headache, occasional pain in back and legs, sore throat, increasing difficulty in swallowing and marked prostration. He is pallid and appears to be afflicted with some grave illness. The pillars, tonsils, posterior pharyngeal wall, soft palate and uvula are very red and swollen and the uvula is frequently edematous. The fever rarely exceeds 102°, the pulse is full and relatively slow and the respiration slightly increased. Only infrequently is there a moderate luekocytosis and the urine frequently presents a considerable volume of albumin and granular casts. These cases run a course of three to eight days and leave the patients much exhausted. One such case in this series has been complicated by an acute suppurative otitis media and mastoid tenderness without leukocytosis. Another died of streptococcus septicemia in four or five days. A third case developed cervical cellulitis, some days following the throat infection. This suppurated and the patient died of purulent meningitis following septic thrombosis of the jugular vein and lateral sinus, and a fourth case developed a fatal purulent peritonitis. In both of these latter cases the infiltrated areas in the neck were incised for drainage. No pus was discovered at the time of operation, but free purulent discharge occurred some hours later. It has been this group of cases which has given rise to the majority of deaths in other epidemics, the fatal condition appearing some days after apparent cure of the patient.

"The second class of cases, membranous septic inflammation, is characterized by all the signs and symptoms of group one plus the formation of a dirty grayish white membrane which is irregularly disposed upon the tonsils, pillars, soft palate and the pharyngeal wall. It strips easily without bleeding and consists largely of pus cells, streptococci and detritis. Various degrees of edema are frequently associated with this class and is most frequently noted on the uvula and pillars. A typical example of this group entered the clinic with a temperature of 104°, pulse 104, a grayish red throat, patches of membrane on the tonsils, pharyngeal wall and soft palate, marked edema of the uvula and pillars with bulging of the anterior pillar upon the left side, no

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leukocytosis and acute septic nephritis. Two hours later the temperature was 103.4° and pulse 92. The pulse did not exceed 100 again during the disease, despite temperature of 103.4°. Frequently the pulse was below 90 with such a temperature. Eight hours after admission the membrane had disappeared, the throat was scarlet in color, the patient had a typical strawberry tongue and erythema which covered the neck and thorax and was not noted in the folds of the body. His whole appearance strongly suggested scarlet fever. Twelve hours later the picture of scarlet fever had disappeared, the temperature assumed the remittent type, ranging from normal to 104° with a slow full pulse averaging 85. Small submucous abscesses appeared on the margin of the palate and base of the uvula. The whole throat was grayish red. During the next two days these abscesses ruptured, leaving superficial ulcers and other ulcerated areas appeared upon the pillars and posterior pharyngeal wall. The temperature gradually declined to normal during the succeeding four days and the ulcers, excepting an area including the whole anterior aspect of the uvula, healed. The patient was discharged on the ninth day following admission."

"Another case in this group had considerable edema which had been largely confined to the epiglottis, glottis and trachea together with abscesses at the base of the tongue and in the false cords. Also a diffuse board-like cellulitis in the neck which reached the plane of the chin at times and later was located within the outline of the thyroid gland and which never softened. He had a remittent temperature, characteristic slow pulse, no leukocytosis, and several brief suffocative attacks due to edema. During two days the patient suffered a toxic delirium with a temperature not exceeding 101.° Later the patient developed a leukocytosis, an abscess at the base of the tongue which eventually ruptured and the patient made an uneventful recovery."

"The third class of cases, edematous inflammation, presents the most striking picture. The onset, excepting the congestion and swelling. is identical with group one. The fauces and pharynx are gray and edematous, the swelling of the tonsil is enormous and proceeds rapidly until the oral pharynx is completely shut off from the mouth, necessitating nasal feeding. The temperature does not exceed 101° and the pulse is somewhat more rapid than in the other group. Toxic nephritis follows the onset shortly. This condition persists from three to eight days without glandular involvement and disappears as rapidly as it came. The prostration in this class is very severe."

"The fourth class of cases, suppurative cellulitis, is identical in onset with group one and the signs may be any combination in groups two and three. The suppurative areas may be localized in the throat, larynx, accessory sinuses or neck and may be followed by suppurative processes in any part of the body. The local epidemic has produced small suppurative areas in the fauces, larynx and neck, followed in three cases by either purulent meningitis or peritonitis. One case has

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been complicated by empyema of the antrum of Highmore and frontal sinus."

"The most striking features of all these cases are the comparatively slow, full pulse which is out of any proportion to the fever, almost invariable absence of leukocytosis, the frequency of a marked toxic nephritis, and the extensive cervical cellulitis which rarely suppurates."[8]

The bacteriology of this epidemic has been carefully worked out by Doctor David J. David, of Chicago,[9] from whose findings the following is quoted: "The streptococcus, as it appears in smears of the exudate, occurs in pairs or very short chains and may be slightly lanceolate in form. In chains, when present, the cocci are arranged in twos. They are strongly Gram positive and surrounded by definite capsules. The capsular substance is distinct but less abundant than that about the pneumococci and does not indent, or only very slightly so, between the pairs as does the pneumococcus capsule. From a typical case of mastitis in a cow from a farm, a streptococcus was obtained pure, which was pathogenic to animals, became encapsulated on animal passage and agreed in all essential respects to the human epidemic streptococcus. A coccus identical in morphology, in culture and in pathogenicity was obtained from a human case of tonsillitis and arthritis on the same farm. The relation of these streptococci to the common hemolytic variety, streptococcus pyogenes, is certainly very close. They may be identical, the difference as noted being caused by environmental factors."

The treatment consists in the use of saline cathartics, hot cleansing throat gargles, ice applications, urotropin and polyvalent or autogenous vaccines. Nothing is to be gained by incision of the areas of cellulitis and the rapid supervention of suppuration seems to contraindicate this procedure.

The experience in the Boston and Chicago epidemics should teach us that even the most careful supervision of dairy products may fail in the absence of an adequate pasteurization and care in subsequent distribution. The "Flash method" of pasteurization—the milk being raised to 145° for a few seconds only—proved its inefficiency in the case of the Chicago epidemic. The pasteurization should be accomplished by the "Holding method", the milk being kept at 145° for twenty minutes.

[1] NASH: *Lancet*, June, 1902.
[2] HALL: *Journal of the American Medical Association*, June 22, 1902.
[3] WINSLOW: *Boston Medical and Surgical Journal*, December 4, 1911.
[4] DARLING: *Boston Medical and Surgical Journal*, December 4, 1911.
[5] CAPPS AND MILLER: *Journal of the American Medical Association*, June 15, 1912.
[6] HAMBURGER: *Journal of the American Medical Association*, April 13, 1912.
[7] HIRSTBERG: *Journal of the American Medical Association*, April 20, 1912.
[8] SMITH: THE PHYSICIAN AND SURGEON, June, 1912.
[9] DAVIS: *Journal of the American Medical Association*, June 15, 1912.

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DISCUSSION.

DOCTOR FREDERICK G. NOVY: I have been very much interested in the cases I have heard of, but I have not come in touch with any of them. I sent over to the hospital for blood on two occasions at the request of Doctor Peterson. In both instances pure cultures of a typical streptococcus were isolated. I think it is of the ordinary streptococcus type. In the case of the last patient (Mr. C.) the blood cultures showed but very few organisms. Indeed, at the end of twenty-four hours the cultures were all negative. But on the second day several of the tubes developed organisms; most of them, however, remained sterile. In view of this fact I should think the prognosis in Mr. C's case was very favorable.

It may be of interest to recall that one of the earliest observations which demonstrated the existence of a streptococcus sore throat was that of Prudden. In 1888 he reported upon a study of twenty-four cases of so-called diphtheria occurring in a New York institution. All of these cases gave cultures of a streptococcus which Prudden, since he failed to find the Loeffler bacillus, named the streptococcus diphtheriæ. Shortly afterward, however, the Loeffler bacillus was found to exist in this country, the same as in Europe, and with its recognition as the cause of diphtheria, the streptococcus was relegated to a secondary position.

I do not think there is any doubt but that in this epidemic we are dealing with a pure streptococcus infection. It is not a new disease or infection. Instead of having a new organism we have but an old friend who has had special training. Where it came from we cannot tell. The question of milk as a vehicle has been brought to the front in Boston, Chicago and elsewhere but we cannot trace it to the milk in our own town.

DOCTOR JAMES F. BREAKEY: The Chicago infection was said to have been caused by milk, but there is no reason to think that the present epidemic must be due to the same cause. I took the trouble to investigate the milk supply in the different patients suffering from sore throat, and found nothing in common whatsoever. We could find no evidence that the milk was responsible for the epidemic. Personally I feel satisfied that the epidemic is due to infection from case to case.

Now as concerns the water supply as a possible source of infection. Since they have been putting in the new dam at the water works, we have had a sanitary inspector there, a bacteriologist from the laboratory, and he has examined the water daily, and the character of the reports received have been surprising to me. The water from the city water works supply is quite pure water from the bacteriologic standpoint. There has not been a colon germ discovered. A number of people who have gone out to the Country Club have been complaining of bowel trouble. I took some of the spring water to analyze. It was

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the dirtiest specimen I ever saw, and loaded with colon bacilli. Specimens from the containers in the house, and from the ice also were loaded with colon bacilli.

Doctor John A. Wessinger: I have no doubt that this disease which we have heard discussed, is as Doctor Novy has well said, "an old friend with special training." We have seen it for some time, years and years gone by, but perhaps not quite as active as at the present time. I feel convinced that the disease is contagious and some precaution should be taken along this line. I think it would be a good practice to isolate these cases. I have observed one case after another in families affected with it. This disease is among us more or less all the time, but in different forms, so that I think what Doctor Warthin said has a good deal of bearing upon the epidemic—"that we have passed through a very severe winter and our general resistance is very poor"—for we know how many severe cases of pneumonia there were during this winter. Another thing I have noticed, that this infection has been very rare among small children. I do not recall a case among children under five years of age. It has been common among young adults, a good many cases among older people, but of a very mild form. I have also noticed the frequent association of abscess with this condition which is not usually seen in this disease. We usually look for the infection during the months of March and April, but not commonly during the hot days of May and June.

This disease is not limited to students but is also prevalent among the town's people and has been quite frequently encountered in the rural districts.

Since there is a close relationship between tonsillitis and rheumatism, I am very partial to the antirheumatic treatment for these cases. I have also used aspirin in large doses, normal salt solution gargle, hot drinks, nutritious food and rest in bed.

Doctor R. Bishop Canfield: The Otologic clinic has seen a number of the cases. It may be mentioned that all the types mentioned in this epidemic have been previously described. The types characterized by ulceration, cellulitis and suppuration have been considered carefully in England several years ago. Logan Turner described very accurately these four types and included them all under "acute epidemic sore throat." The cases which we have seen and which have proved serious showed the absence of any involvement of the tonsils. There was no involvement of the tonsils except edema. The serious cases showed ulceration of the subepithelial tissues and pharyngeal walls. Ulcers have been noted in the larynx and epiglottis and it even became necessary to look for this condition in the course of the disease.

In several cases noted, there was marked involvement of the thyroid. In one case the thyroid was very large and "hard as a board." There were several cases of marked enlargement of the neck, in some cases the area of infiltration being almost as large as the head. These

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cases have shown marked dyspnea and, in some cases we have been so concerned, that we had a flexible catheter by the bedside constantly for use in case of emergency, for tracheotomy would have been impossible on account of marked swelling of the neck. Severe secondary infection always followed the cases operated upon. In our cases we have not seen marked leukocytosis, many having had a normal leukocyte count. One man had simple quinsy, was sick a day or two and showed none of the symptoms of the epidemic. The danger in these cases has been the complications, except in one case, where marked edema of the pharynx and epiglottis caused marked interference in respiration.

I am much interested in the progress of the case which Doctor Van Zwaluwenburg has described. When I saw him first he showed superficial ulceration of the soft palate with no involvement of the tonsillar region. It is the only case I have seen where the tonsils have been previously removed. Although we did not believe he had meningitis, he had a suspicious delirium and so lumbar puncture was done. I am not so certain, as is Doctor Van Zwaluwenburg, that the urotropin caused the bloody urine. I have given it in these cases in large doses and have not seen it have such an effect. Doctor Van Zwaluwenburg says that the patient possibly has chronic pyemia, for which condition there seems to be a bad prognosis. However, it seems to me that this man has a very good chance of recovery because of the fact that he has kept up so long, that his temperature is growing less and because his delirium is not so pronounced.

In regard to the two cases which I saw with Doctor Warren, where he suspected quinsy, the tonsils were normal and the patient had marked cellulitis of the tissues nearer to the pharynx than to the surface of the skin. Another case showed a more superficial infiltration. It seems to me that this epidemic has been one of septic pharyngitis rather than tonsillitis.

We should be careful how we diagnose follicular tonsillitis, mentioned as occurring here in Ann Arbor. Most of the mild cases have not been examined bacteriologically and we do not know whether they are to be classed with the disease under discussion or not. Clinically this infection does not look like the streptococcus pyogenes, because we do not have any pus. In regard to the contagion, I hardly believe that this friend of Mr. C. who developed symptoms was a contact case. He was only sick a short time. We have to be careful how we class these cases of ordinary follicular tonsillitis.

Doctor Luther F. Warren: Doctor Hamburger, of Baltimore, reports that most of their cases of epidemic sore throat are developing in children, while Winslow, of Boston, and Capps and Miller, of Chicago, show that most of their cases were in adults. The cases that I had the privilege of studying numbered twenty-one adults and three children, and the clinical picture of those three cases was decidedly less serious than those of the average adult type. As regards conta-

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gion, I noted two cases developing in a family where one patient had previously been affected. In the remaining twenty-two cases, slight prophylactic measures, such as a gargle and partial isolation of the patient, probably prevented the spread of the infection. Judging from these cases, my opinion is that the condition is not virulently contagious.

REPORTS OF CASES.

A CASE OF SEPTICOPYEMIA FOLLOWING ULCERATIVE PHARYNGITIS.

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MR. C., aged twenty-eight, a medical student, on the 12th day of July complained of some chilliness, beginning with headache about 10 A. M. He shortly developed a chill and immediately entered the University Hospital. At entrance his temperature was 102.4°, pulse 100, and respiration 24, leukocytes 15,000. He was at times mildly delirious and complained of a very intense headache and a sense of constriction about the waist. Examination showed nothing but a small amount of dusky redness of the pharynx. Both tonsillar fossæ were empty, the tonsils having been removed the preceding spring. There was no coryza and very slight cough. The following day the symptoms of coryza had somewhat increased and a very marked herpes appeared about the mouth. The morning of the third day a large edematous area, rather pale, pitting on pressure and surrounded with a narrow pink areola appeared on the dorsum of the right foot and on the application of an ice-bag disappeared that same day. On the fourth day the patient was seen in consultation by Doctor Ferris N. Smith, who reported there was no local cause for the intense headache and no evidence of sinus infection, only a very mild injection of the anterior pillars and posterior pharynx. That night he became markedly delirious. On the following morning a blood culture was taken, which proved negative and since the temperature persisted at a fairly constant elevation between 102° and 105°, this was repeated on the seventh day with similar results.

At this time the patient presented a rather alarming picture. Superficially he had all the appearance of a very severe case of typhoid with a stupid delirium, marked typhoid mouth, a dicrotic pulse with a tendency towards diarrhea. He had, however, none of the abdominal signs, no distension, no tenderness, no rigidity. The liver and spleen were not palpable. A Widal done at this time proved negative. The patient also began to complain of soreness of the wrist with slight swelling and redness over the dorsum of each hand. Within the preceding twenty-four hours he had passed no urine and was catheterized at 10 P. M. The following morning he was seen by Doctor Canfield in consultation, in whose opinion the throat condition was that of mild septic sore throat. Lumbar puncture was done, but the fluid was under

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no increased tension and normal to all laboratory tests. On the ninth day, the third blood culture was taken, which on the following day showed complete hemolysis with very few organisms and only after forty-eight hours growth of short-chained streptoccocus. On the advice of Doctor Canfield the patient was given large doses of urotropin. Four hours later, he had a chill with sharp rise of temperature. This was repeated in the next fourteen and sixteen hours, reaching a maximum of 106.4° the afternoon of the tenth day. Following this there was a remission of the fever, although the pulse rate continued to rise gradually and respiration rate held fairly constant. There also appeared the maximum leukocyte count. The swelling in the hands increased in size and became fluctuating. On the fifteenth day they were incised, letting out considerable pus from both sides. The left knee was aspirated but no pus obtained. On the seventeenth day the patient complained of bladder tenesmus and that night passed bloody urine. He began to pass his stools involuntarily. Urotropin was withdrawn at 6 A. M. and in the course of the next six days the cystitis improved insofar that gross hemorrhage no longer occurred. The involuntary bowel movements have persisted, however, to the present date. Otherwise his condition has been about the same.

In spite of diligent search, no other areas of localization have been discovered. From the twelfth to the sixteenth day there were certain indefinite signs over both lungs in the interscapular spaces. In fact at one time thoracentesis was contemplated, but on the following day the signs changed to such a degree that we deemed it wise to postpone thoracic puncture until a time when the patient's condition should be more favorable. These signs have persisted and have varied from day to day with a gradual tendency to clear up, and at no time have we felt justified in doing a thoracic puncture.

The general course of his fever and the leukocyte count will be readily appreciated by reference to the accompanying chart. Clinically this case presents certain rather exceptional features. According to all textbooks a streptococcus septicemia is distinguished from others by the prominence of delirium, rapid pulse, gastrointestinal symptoms, enlargement of the spleen and a tendency toward nephritis and endocarditis. It is to be noted, however, that none of these features was very pronounced in the present case with the exception of the delirium.

For the last two weeks this feature has been rather of an exceptional type. There has been no lack of attention or understanding on the part of the patient. He has answered questions promptly and intelligently but irrelevantly. He has been quite disoriented as to person and time, and hallucinations have been very prominent. With the exception of the period of the first ten days there has been very little stupor and no thickness of speech. His mental condition reminds one very much of certain cases of toxic psychosis, which we have seen in Doctor Barrett's clinic, especially in association with chronic malignant endocarditis.

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After the first day the pulse rate ran remarkably low until later complications arose. At no time has it been noticeably high in relation to the fever. The gradual upward tendency of the curve undoubtedly depends on the progressive exhaustion of his illness.

Mr. C.'s gastrointestinal tract has been very free from disturbance. He has never vomited and has taken large amounts of food with comparative comfort. His bowels have not been loose except when his food intake was relatively very high and usually promptly responded to the reduction in the number of calories prescribed.

At no time has there been any enlargement of the liver or spleen. Repeated examinations by different individuals will corroborate this statement. With the exception of the period when blood was present in the urine, this excretion has been free from albumin and with only an occasional cast during the time of his highest temperature.

When first seen the patient showed a systolic murmur at the apex, poorly transmitted to the axilla, slight accentuation of the pulmonic second, but apparently no enlargement of the heart. This condition is supposed to have been present for a number of years. These findings have persisted with very few variations except that the heart rate and intensity of cardiac sounds has suffered the usual febrile changes. No additional murmurs have developed. Enlargement if any, is very slight, and no evidence of cardiac weakness can be deduced, except from the auscultation of the usual heart sounds. We do not believe that any endo- or pericardial infection can be presented here.

The above peculiarities seem to us to justify the assumption of an infection other than the ordinary streptococcus pyogenes, especially when supported by the opinion of the laryngologists, who have seen many of these cases and are familiar with the local changes. It must also be remembered that this infection did not follow tonsillitis but a pharyngitis, the patient having no tonsils and the tonsillar crypts being clean and empty.

CASES OF EPIDEMIC SORE THROAT.

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Of the twenty-four cases that I had an opportunity to study, thirteen were either cultured or smeared and contained the organism which has been so well described. Of these thirteen cases, six were of the edematous type, seven of the simple hyperemic type and of these later cases, two were fatal, general sepsis terminating both. Of the six edematous cases, no unusual symptoms were disclosed but there were one or two unusual complications. One patient developed an aphonia of a week's duration. A second developed myocarditis, although she was confined to bed two weeks after her constitutional symptoms disappeared. The urine after convalescence showed neither albumin nor casts but she became distinctly short of breath on exertion and her heart rate at times increased beyond the normal. No murmurs

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were discovered in the heart at any time. One case developed quinsy, which was opened in the Otologic department. Four cases showed marked cellulitis of the neck, which persisted on an average of a week after the constitutional symptoms disappeared. Of the seven cases of simple hyperemic epidemic throat, the one symptom which was common to all was marked prostration. One patient in expressing her opinion of her condition said, "I have had tonsillitis many times, but in two or three days I feel perfectly well again. It is now a week since I have had this form, and I feel so prostrated that I cannot get about." The history and findings of the two fatal cases are as follows:

* * *

Case I.—Mr. W., aged twenty-two, a student, whom I saw in consultation with Doctor Gates. His previous and family history are negative. One week before the present illness, he had had an attack of bronchitis, which had kept him in bed. Following this he had been in college a week, and at the end of this time, March 26, he went to his physician complaining of fever and weakness. An examination showed the ordinary throat of acute tonsillitis and he was sent home and placed upon proper treatment. I saw this patient first on the 28th of March, at which time he had a temperature of 103°, pulse of 120, and respiration of 20. The urine showed the characteristics of a febrile urine and he gave 18,000 leukocytes, eighty-four per cent polymorphonuclears. A throat smear showed a streptococcus in pairs. Otherwise his physical examination was negative. On the 29th, the boy complained of periods of being very warm and having definite chills. A blood culture on the 30th showed streptococcus growing in pairs and in short chains. They were obtained in pure culture in each of two flasks and hemolyzed blood rapidly. His leukocytes numbered 9,150. During the day he ran a remittent temperature the highest point reaching 103.8° and lowest 101.4°. He complained of being chilly on two separate occasions but no definite chills presented. A Widal at this time was negative, as was also a Diazo reaction. The following day he complained of pain in both elbow-joints, the left ankle, both knees, right shoulder and left thumb. The joints were tender, swollen, reddened and painful on movement. The salicylates were administered. The patient began to cough during the day and on several occasions spat up bright red blood, which showed streptococci of the nature that were found in the throat and in the blood culture. At 8 P. M. thirty cubic centimeters of antistreptococcic serum was given, which apparently had little effect upon either temperature or pulse rate. The day following, April 2, the respiratory rate began to increase, but there were no physical signs of a frank pneumonia. Rather, the lung signs were of a marked bronchitis with beginning bronchopneumonia, which was interpreted as of metastatic origin. During the day the patient continued to raise fresh blood and become delirious at times. His pulse rate gradually increased with a temperature reaching 104.8° at 4 P. M. At 8 P. M. he was again given thirty cubic centimeters of anti-

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streptococcic serum, but apparently a second time without results. On the 3d of April, his dyspnea became more marked, the heart rate increased, and the radial pulse at times was not palpable. He passed urine and stools involuntarily. This was associated with delirium. In the morning his conjunctivæ were tinged with bile, and urinary examination substantiated this finding. His jaundice continued, increasing very rapidly, so that at death, twenty-four hours later, he was markedly icteric. His leukocytes numbered 14,000 and the urine showed only a very slight amount of albumin with a few pus cells and casts. The terminus of this case is that which we so frequently see in cases of general sepsis, where there is a high temperature, high pulse rate and rapid respiration, due in all probability to a marked intoxication. The length of his illness was barely a week.

* * *

Case II.—Mr. M., seen in consultation with Doctor Kamperman. The patient gave a history of an attack of tonsillitis five days before the present attack, with which he was confined to bed two days. He then resumed his work and on the second day was taken with a definite chill. Upon reaching home, he sent for his physician, who found a temperature of 103° with evidence of a return of his throat condition. I saw the patient the third day of his illness. At this time he had a temperature of 103°, pulse 108, respiration 18, leukocytes were 17,500 and the throat showed a diffuse, angry redness with slight enlargement of either tonsil. A very thin membrane was present on one side, which, smeared, showed the presence of streptococci of the short-chained type. The temperature for the previous two days had fluctuated greatly, varying four degrees at one time in one hour. The patient had complained of being chilly early in his illness, but had not been so troubled for the past twenty-four hours. A blood culture on the following day developed a short-chained streptococcus as in the previous case, and the patient also complained of pain in the left ankle. Twenty-four hours later, the right wrist became swollen and tender, but no other joints were apparently involved. Late in the afternoon of the third day the patient became slightly delirious, and passed a small stool involuntarily. From this time on he remained very restless with practically continual delirium. Antistreptococcic serum was administered on the fifth day, and the temperature dropped from 103° to 100° within three hours. It again started to increase, and thirty cubic centimeters were again administered, at which time his temperature reached 98.8°. The temperature rose again suddenly to 103° but apparently was lowered again by the serum to 101.6°. At 7 P. M. on the sixth day of his illness electrargol was given intravenously, but with no apparent results. On the seventh day of his illness, June 5, the patient's condition was critical, since the respirations reached 50 with the lungs practically negative. The temperature steadily rose, reaching 106° at 12 M., with a pulse of 140 and respiration of 44, at which time he died.

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These two cases, although the patients were carefully nursed with supportive treatment of brandy, strychnin, nutritious food, salines, et cetera, progressed rapidly to a fatal issue. The striking picture that each presented, was a throat very slightly involved, with marked constitutional symptoms. The value of the blood culture in arriving at a definite diagnosis is inestimable.

* * *

Case III.—I present a third case on account of its unusual temperature chart. It was that of a boy of eight years, whose throat culture showed the organisms previously described. For a period of two weeks he ran an intermittent temperature, it being practically normal until 8 o'clock in the morning, at which time it would rise very abruptly. At the beginning of the attack it reached 103.6°, and gradually diminished daily until a normal temperature curve was present.

A CASE OF SEPTIC SORE THROAT WITH AUTOPSY.

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Department of Surgery.

I DESIRE to report a case of streptococcus pleurisy and peritonitis, which was probably secondary to a sore throat.

The patient, a student, aged twenty-one, came to my office on July 7, 1912. He complained of nausea, lassitude and general discomfort. Three days previous he had had a very sore throat, which, however, had improved rapidly. The day before consulting me he began to feel ill again.

An examination of the throat showed some exudate upon the tonsils and uvula, but there was little congestion and involvement of the regional lymph nodes. His temperature was 103° and pulse 100. A urine examination showed nothing abnormal except for a high specific gravity of 1034. The chest and abdomen were negative. His tongue was badly coated and his bowels had not moved in two days. Calomel was administered but instead of having the desired effect, the patient became actively nauseated, vomiting considerable clear yellow fluid. The next day the nausea and vomiting continued so that he was unable to retain even water. In the morning his temperature was 101° with a pulse of 80. An enema gave good results. The leukocyte count was 13,000. An examination of the abdomen at this time showed slight distension and indefinite tenderness in the region of the liver and gall-bladder. The liver dulness was somewhat increased. During the afternoon the temperature was 102° and the pulse 83. The vomiting continued and there was flatulency with frequent belching of gas.

On July 9 the patient seemed better. He retained some water and malted milk. The bowel movements were free and his temperature ranged lower. At no time during the first forty-eight hours were there any definite abdominal or thoracic signs, although frequent examinations were made.

About 4:30 P. M., fifteen minutes after his last bowel movement, he

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was seized with a violent abdominal pain. When seen at 6:30 P. M. his legs were drawn up, he was belching frequently and complained of great pain. The abdomen was moderately distended and very rigid with tenderness most marked, if there was any difference, in the bladder and right iliac regions. The temperature was 104° and the pulse 90.

The patient was then admitted to the University Hospital. It was evident that he had peritonitis, probably general in character, since there were no signs of localization. Ice-bags were kept upon the abdomen. A glycerin and salts enema failed to start even gas. A slow saline was started and continued until nutritive enemata were given on the night of the 11th. The patient developed herpes on the lips and ulcers on the side of the tongue. For the next three days there was variable dulness in the lower abdomen, especially on the right side. The dulness changed with each stomach washing and catheterization.

The leukocytes were at times as high as 18,000, and never lower than 13,000. A blood culture was negative. An enema finally resulted in a small yellow stool, followed later by another; later he frequently passed well digested stools. The temperature and pulse had steadily improved, the former ranging from 101° to 102°.

During this period there were gradually increasing signs of trouble in the thorax. On the 12th there were signs at the right base, and on the 13th there was a friction sound in the same location. Gradually dulness developed on the left side until it reached almost to the nipple. This dulness did not vary with position and aspiration failed to reveal any fluid. With the development of this dulness, the respiration became difficult and the pulse began to creep up. On the 17th there was continuous delirium and all the symptoms of intoxication increased until the morning of the 20th when he died.

A remarkable thing about this case is that during the time his symptoms were increasing, he was taking large quantities of nourishment, was having well-digested stools, and passing normal urine. Nothing seemed to have any effect upon the progress of the disease, and while the fight looked hopeless, judging from reports of similar cases, after the digestive functions were resumed it looked as though there was a good fighting chance for recovery.

The autopsy performed by Doctor Aldred S. Warthin showed: fibrinopurulent pleurisy; general peritonitis; involvement of the peritoneum through the diaphragm; purulent inflammation of the diaphragm; general cloudy and fatty degeneration; the whole forming a picture of streptococcic septicemia.

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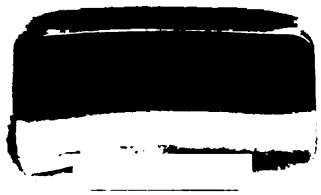

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